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San Francisco Municipal Railway

Proposition E
Municipal Transportation Quality Review

Draft Final Report

Submitted By:
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Executive Summary

Proposition E – The Muni Reform Initiative

On November 2, 1999, the voters of San Francisco overwhelmingly approved Proposition E, the most substantial reformation in Muni history. The voters' intent was to institute structural, administrative and financial reforms designed to provide Muni with the "resources, independence and focus necessary" to become one of the best urban transit systems in the world. Recognizing the City's dependence on public transit and its need for efficient and reliable transit service that can compete with the private automobile, the drafters of the initiative sought to restructure the City's provision and administration of transportation and parking services and strengthen the City's Transit-First Policy.

The overall goals for transit service articulated in Proposition E (now Article VIIIA of the San Francisco City Charter) are as follows (Section 8A.100):

1. Reliable, safe, timely, frequent, and convenient service to all neighborhoods;
2. A reduction in breakdowns, delays, over-crowding, preventable accidents;
3. Clean and comfortable vehicles and stations, operated by competent, courteous, and well-trained employees;
4. Support and accommodation of the special transportation needs of the elderly and the disabled;
5. Protection from crime and inappropriate passenger behavior on the Municipal Railway; and
6. Responsive, efficient, and accountable management.

To achieve these goals, Article VIIIA created the Municipal Transportation Agency (MTA), combining the responsibility for street operation (Department of Parking and Traffic) with the dominant "user" of the streets – Muni. Article VIIIA also established service standards and accountability measures, and required an independent, biennial quality review of transit operations. This report represents the findings of the first independent review of Muni's performance since the passage of Proposition E.

Proposition E Service Standards

The service standards (or performance measures) adopted under Proposition E were not intended to create onerous reporting requirements, but rather to provide Muni with the tools needed to create a world-class transit service. In order to do this effectively, the service standards need to provide information and feedback that Muni's management can readily use to help shape decisions and policies so that the desired outcomes can be achieved.

While Proposition E specifically stated the method of measurement and goals for several of the service standards, it also provided some flexibility with regard to the way in which other standards could be measured and the milestones or goals to be achieved. When not specified by Proposition E, the MTA Board adopted methods and definitions of measurement as well as specific goals and milestones for each of the service standards. Additionally, Section 8A.104 of the City Charter allows the MTA Board to vote to amend any of the service standards (after holding a public hearing on any such amendments).

Muni's Citizen's Advisory Committee (CAC) and the MTA Board review Muni's performance quarterly, and review the definitions of measurement, methods of measurement and the goals for each of the service standards annually. Muni publishes quarterly Service Standards Reports which include a description of each of the Service Standards and a summary of Muni's performance. (These reports are available to the public via Muni's web site.) These reports also include additional performance information that is not required by Proposition E, but is used by Muni for other purposes, such as employee incentive programs.

Table ES-1 summarizes the service standards that are required by Proposition E, the actual measurements that are made, the goals or milestones that have been established, and overall performance during the period covered by this review (FY2001 and FY2002). (For a more detailed discussion of performance, please see the body of this report.)

Table ES-1: Proposition E Service Standards and Performance

Service Standard	Prop E Requirements	Measurement	Comments	Goal or Milestone	Systemwide Performance (Audited for FY2001 and FY2002; Unaudited for FY2003)
A. SYSTEM RELIABILITY					
1a. % of vehicles that run on time according to published schedules.	On-time performance standard:85% of vehicles must be on-time (no more than 1 minute early or four minutes late as measured against a published schedule).	Actual arrival times compared against published times (quarterly average for systemwide, mode, and division).	Specifically measures what is required by Prop E.	FY2001: 65% FY2002: 70% FY2003: 75% FY2004: 85%	FY2001: goal achieved FY2002: goal achieved FY2003: failed to achieve goal
2a. % of scheduled service hours that are delivered and % of scheduled vehicles that begin service at the scheduled time.	Service delivery standard: 98.5% of scheduled service hours must be delivered, and98.5% of scheduled vehicles must begin service at the scheduled time.	– % operator availability (quarterly for systemwide, mode, and division) – % equipment availability (quarterly for systemwide, mode, and division) –% total availability (quarterly for systemwide, mode, and division) – % of late pull-outs (quarterly for systemwide, mode, mode and division)	Specifically measures what is required by Prop E; however Prop E does not state that % of hours delivered for operator availability and equipment availability be specified separately.	FY2001: 96.5% FY2002: 97% FY2003: 97.5% FY2004: 98.5%	FY2001: failed to achieve goal FY2002: goal achieved FY2003: failed to achieve goal
3a. Missed service due to either insufficient vehicles or driver unavailability as a percentage of scheduled service hours.	Missed service due to either insufficient vehicles or driver unavailability as a percentage of scheduled service hours.	– % hrs missed due to operator availability (quarterly for systemwide, mode, and division) – % hrs missed due to equipment availability (quarterly for systemwide, mode, and division) – % of total hrs missed (quarterly for systemwide,	Specifically measures what is required by Prop E; however Prop E does not state that % of hours missed due to operator unavailability and equipment unavailability be specified separately. This standard is simply	FY2001: 3.5% FY2002: 3% FY2003: 2.5% FY2004: 1.5%	FY2001: failed to achieve goal FY2002: goal achieved FY2003: failed to achieve goal

Service Standard	Prop E Requirements	Measurement	Comments	Goal or Milestone	Systemwide Performance (Audited for FY2001 and FY2002; Unaudited for FY2003)
4a. % of vehicles that pass published time points during measurement periods unable to pick up passengers due to crowding without being followed within 3 minutes or less by another vehicle on the same route with space for all waiting passengers.	% of vehicles that pass published time points during measurement periods unable to pick up passengers due to crowding without being followed within 3 minutes or less by another vehicle on the same route with space for all waiting passengers.	% of vehicles passing by passengers due to overcrowded vehicle(quarterly for systemwide, mode, and division).	MTA Board adopted a sampling methodology to determine percent of pass ups systemwide and for each mode. MTA Board also adopted a specific goal.	< 5%	FY2001: goal achieved FY2002: goal achieved FY2003: failed to achieve goal for four out of 12 months
5a. Peak period passenger load factors.	Peak period passenger load factors.	% of passengers onboard vehicle that exceed combined seating and standing capacity(quarterly for systemwide, mode, and division).	MTA Board adopted a definition and method of measurement and a specific goal.	≤ 85% of combined seating & standing capacity	FY2001: failed to achieve goal FY2002: failed to achieve goal FY2003: failed to achieve goal
6a. Actual headways against scheduled headways on all radial, express, cross-town, secondary and feeder lines for peak, base, evening and late night services.	Actual headways against scheduled headways on all radial, express, cross-town, secondary and feeder lines for peak, base, evening and late night services.	% revenue vehicles adhering to scheduled headways (quarterly for systemwide, mode, and division).	MTA Board adopted a definition and method of measurement and specific goals.	FY2001: ≥ 80% FY2002, FY2003, FY3004: ≥ 85% of the time within 30% or 10 minutes of scheduled headway (whichever is less)	FY2001: failed to achieve goal FY2002: failed to achieve goal FY2003: failed to achieve goal
7a. % vehicle availability and reliability (mean distance between failure) by mode.	% vehicle availability and reliability (mean distance between failure) by mode.	% vehicle availability (quarterly for systemwide, mode, and division).	Only report % vehicle availability. Reliability is reported under Service Standard 9a. MTA Board adopted a specific goal.	≥ 98.5% vehicle availability	FY2001: goal achieved (except for light rail) FY2002: goal achieved (except for light rail) FY2003: goal achieved (except for light rail)

Service Standard	Prop E Requirements	Measurement	Comments	Goal or Milestone	Systemwide Performance (Audited for FY2001 and FY2002; Unaudited for FY2003)
8a. Unscheduled absences by operator, mechanical and administrative personnel.	Unscheduled absences by operator, mechanical and administrative personnel.	% of absences not scheduled in advance by personnel (quarterly).	MTA Board adopted a definition and method of measurement and specific goals. Also use data for employee incentive goals.	Annual 5% reduction of YTD for Maintenance (Mechanical), 10% reduction for Transportation (Operators), and 5% reduction for Admin	FY2001: failed to achieve goal for all divisions FY2002: Administration Division failed to achieve goal; goal achieved for other divisions FY2003: goal achieved for all divisions
9a. Miles between roadcalls btty mode.	Miles between roadcalls by mode.	Miles between roadcalls or mean distance between failures (MDBF) (quarterly for systemwide, mode, and division).	MTA Board adopted a definition and method of measurement and specific goals.	Increase miles between roadcalls – specific goals are established each fiscal year and quarter for each division	FY2001: seven out of ten divisions achieved goal FY2002: five out of nine divisions achieved goal FY2003: 6 out of nine divisions achieved goal
B. SYSTEM PERFORMANCE					
1b. Passengers carried by mode.	Passengers carried by mode.	– # of people boarding revenue vehicles (annually for systemwide and mode). – % change in ridership from previous year (annually for systemwide and mode).	MTA Board adopted a definition and method of measurement and specific goals.	FY2001 and FY2002: 2% increase over previous year FY2003 and FY2004: 224 M passengers	FY2001: goal achieved FY2002: goal achieved FY2003: failed to achieve goal
2b. Fare revenues generated by mode.	Fare revenues generated by mode.	– Onboard fare collected on revenue vehicles (annually)– Sales of individual tickets (annually) – Sales of passes (annually) – Muni's share of regional passes sold (annually)	MTA Board adopted a definition and method of measurement and specific goals.	FY2001 and FY2002: increase fare revenue by $1.0M over previous year FY2003: $100 M in fare revenue FY2004: $117 M in fare revenue	FY2001: goal achieved FY2002: goal achieved FY2003: failed to achieve goal

Service Standard	Prop E Requirements	Measurement	Comments	Goal or Milestone	Systemwide Performance (Audited for FY2001 and FY2002; Unaudited for FY2003)
3b. Hours and miles operated by mode.	Hours and miles operated by mode.	– # of vehicles' revenue hours (annually by mode) – # of vehicles' revenue miles (annually by mode)	MTA Board adopted a definition and method of measurement and specific goals.	FY2001 and FY2002: 1.2% increase in revenue miles and revenue hoursFY2003: 3.6M hours and 25M milesFY2004: 3.5M hours and 25M miles	FY2001: goal achieved FY2002: goal achieved FY2003: goal achieved for miles; failed to achieve goal for hours
4b. Expenses incurred by mode.	Expenses incurred by mode.	Only reports whether or not costs were within budget. Does not report actual expenses incurred by mode.	MTA Board adopted a definition and method of measurement and specific goals.	Expenses to remain within budgeted amount	FY2001: goal achieved FY2002: goal achieved FY2003: not stated in Service Standard Report
C. STAFFING PERFORMANCE					
1c. Net vacancies by position (vacancies remaining once promotions and new hires have been deducted from retirees or resignations) for each division.	Net vacancies by position (vacancies remaining once promotions and new hires have been deducted from retirees or resignations) for each division.	Budgeted positions (for the year) and percent of vacancies (quarterly by division)	MTA Board adopted a definition and method of measurement and specific goals.	≤ 5% vacancy rate	FY2001: goal achieved FY2002: goal achieved FY2003: goal achieved
2c. Attrition rates for new employees, by division and level.	Attrition rates for new employees, by division and level.	# of new hires, releases and voluntary separations divided by total number of new hires in same quarter (quarterly by division)	MTA Board adopted a definition and method of measurement and specific goals.	≤ 10%	FY2001: failed to achieve goal FY2002: failed to achieve goal FY2003: failed to achieve goal
D. CUSTOMER SERVICE					
1d. Development of annual marketing plan identifying specific programs and projects that will promote increased patronage.	Development of annual marketing plan identifying specific programs and projects that will promote increased patronage.	Develop and publish Marketing Plan annually.	MTA Board adopted a definition and method of measurement and specific goals.	Annual Marketing Plan published	FY2001: goal achieved FY2002: goal achieved FY2003: not stated in Service Standard Report

Service Standard	Prop E Requirements	Measurement	Comments	Goal or Milestone	Systemwide Performance (Audited for FY2001 and FY2002; Unaudited for FY2003)
2d. Publication and distribution to the public of schedules for all trips taken by all vehicles that shall consist of specific arrival times at terminals and established intermediate points.	Publication and distribution to the public of schedules for all trips taken by all vehicles that shall consist of specific arrival times at terminals and established intermediate points.	Printing and distribution of time tables for all vehicle trips, consisting of specific arrival times at terminals and intermediate time points	MTA Board adopted a definition and method of measurement and specific goals.	Printing and distribution of time table	FY2001: goal achieved FY2002: goal achieved FY2003: not stated in Service Standard Report
3d. Operator conduct complaints.	Operator conduct complaints.	– % of Passenger Service Reports resolved within 30 days – % change in # of Passenger Service Reports from previous year(by type of complaint)	MTA Board adopted a definition and method of measurement and specific goals.	Goal 1: 75% of all Passenger Service Reports resolved in 30 days Goal 2: 10% reduction of Passenger Service Reports annually (10% reduction from previous year)	FY2001: goal achieved for complaint resolution; failed to achieve goal for # of PSRs FY2002: failed to achieve goals FY2003: goal achieved for complaint resolution; failed to achieve goal for # of PSRs
4d. Annual passenger surveys and follow-up by management.	Annual passenger surveys and follow-up by management.	– Passenger Survey conducted – Employee Survey conducted	MTA Board adopted a definition and method of measurement and specific goals.	Conduct annual passenger survey and employee survey	FY2001: goal achieved FY2002: goal achieved FY2003: not stated in Service Standard Report
5d. Improvements in public information regarding vehicle delays during operations as well as any general user information regarding system modifications, route changes and schedules.	Improvements in public information regarding vehicle delays during operations as well as any general user information regarding system modifications, route changes and schedules.	Was not developed in FY2001 or FY2002 (in FY2004, stated that measurement would "Assess current practices, develop and implement improvement plan.")	Did not develop specific measurement until FY2004.	Feedback from passenger surveys	Rider surveys were conducted, but were not used to assess the performance of this measure.

Service Standard	Prop E Requirements	Measurement	Comments	Goal or Milestone	Systemwide Performance (Audited for FY2001 and FY2002; Unaudited for FY2003)
6d. Efforts to improve driver training, technical as well as accident follow-up.	Efforts to improve driver training, technical as well as accident follow-up.	– # of hours and type of Driver Training (quarterly and FYTD). – # of accidents, number of operator pay hours worked, accident rate per 100,000 operator pay hours worked (systemwide, division and year – total number of accidents also reported quarterly).	MTA Board adopted a definition and method of measurement and specific goals.	FY2001 and FY2002: 100,000 operator training hours FY2003 and FY2004: 50,000 operator training hours 5% accident reduction over previous year	Goals for operator training hours were achieved in all three fiscal years. Failed to achieve accident reduction goals for all three years.
7d. Number of crime incidents on Municipal Railway vehicles or in Municipal Railway facilities.	Number of crime incidents on Municipal Railway vehicles or in Municipal Railway facilities.	# of incident reports on Muni vehicles or property (systemwide by quarter and annually)	MTA Board adopted a definition and method of measurement and specific goals.	5% reduction from previous year	Goal was achieved in all three years.
E. EMPLOYEE SATISFACTION					
1e. Number of grievances.	Number of grievances.	# of employee grievance reports for transit operators and maintenance & misc. employees (quarterly and annually).	MTA Board adopted a definition and method of measurement, but no specific goal was adopted.	Quarterly grievance report	No specific goal was adopted. Grievance reports were published quarterly.
2e. Speed of resolution of grievances.	Speed of resolution of grievances.	Percent of Operations and Maint. & Misc. Employees grievances resolved within 30 days.	MTA Board adopted a definition and method of measurement and specific goals.	Resolve 75% of internal grievances within 30 days	For all quarters in which data were reported, the goal was achieved for operator grievances. Achievement was less consistent for maint. and misc. employee grievances.

Service Standard	Prop E Requirements	Measurement	Comments	Goal or Milestone	Systemwide Performance (Audited for FY2001 and FY2002; Unaudited for FY2003)
3e. Longevity of employment.	Longevity of employment.	# of employees that leave through retirements, terminations and promotions (job category, annual)	MTA Board adopted a definition and method of measurement, however no specific goals for longevity of employment were adopted.	Annual report of longevity of employment	Reports were published in FY2001 and FY2002.
4e. Employee recognition.	Employee recognition.	Tracking of all employee award programs.	MTA Board adopted a definition and method of measurement, however no specific goals for longevity of employment were adopted.	Annual achievement of honorees in the following award programs (# of awards): (12) Systemwide Operators of the Month Award (4) Transit Supervisors of the Quarter Award (4) Finance & Admin Employees of the Quarter (12) Maintenance Employee of the Month (4) Maintenance Supervisors of the Quarter (4) Safety & Training Employee of the Quarter (4) Accessibility Employee of the Quarter	Actual number of awards made were not included in the Service Standards Reports.
5e. Employee education and training opportunities.	Employee education and training opportunities.	# of hours of training classes by type of training.	MTA Board adopted a definition and method of measurement, however no specific goals for longevity of employment were adopted.	50,000 annual hours of employee training or approximately 20 hours per FTE	FY2001: goal achieved FY2002: goal achieved FY2003: failed to achieve goal

An Independent Transportation Quality Review

This biennial Transportation Quality Review mandated by Proposition E provides yet another tool that Muni can use to continue to improve its performance. This review has been conducted with the following goals in mind:

- Help Muni assess its progress toward the goals and objectives of Proposition E and develop action plans for enhancing performance in areas where there may be some deficiency.
- Evaluate Muni's established goals and performance against the letter and intent of Proposition E.
- Assess whether specific implementation goals and methods and definitions of measurement are appropriate or could be improved.
- Provide independent verification to the public that Muni is on track by auditing Muni's data collection and analysis procedures.

This Transportation Quality Review consists of four main elements:

- **Data review and verification of performance** – Proposition E requires a routine audit of Muni's quality assurance process including an audit of data collection methods and service standard reporting. This is the first audit of Muni's reporting on service standards and covers fiscal years 2001 and 2002 (July 1, 2000 – June 30, 2002). Auditors reviewed Muni's Service Standards Reports from those years to verify that data were collected according to the definitions and methods of measurement specified by the MTA and that reported service standards were computed correctly. Systematic spot checks of original source data and of automated tracking systems and procedures were used to determine the accuracy of reported service standards. During the months of October and November 2003, auditors met with Muni staff responsible for data collection and computation to review both data collection and computation procedures as well as the actual performance data. Appendix A lists the Muni staff who were interviewed.
- **Trends analysis** – Auditors reviewed trends in data and performance achievement over the two-year audit period, as well as unaudited data and performance from fiscal years 2003 and 2004. Findings from this trends analysis were used to develop Action Plans for those areas in which Muni's performance could be improved.
- **Auditor recommendations and Action Plans** – Auditor recommendations focus on ways to further refine or improve performance reporting to make it more relevant to the MTA, Muni management and the public. Action Plans are similar in nature to auditors' more general recommendations, however they focus more specifically on ways to improve performance or make reporting more accurate and relevant, particularly for those service standards in which Muni has failed to meet its performance goals. Although the recommendations and Action Plans focus on the two-year audit period, they incorporate any changes that have been made since that time. Both the recommendations and Action Plans were reviewed with Muni staff to ensure that all recommendations were in line with current budget and resource constraints.
- **Documentation and communication of results** – This report contains the results of the audit, as well as all auditor findings, recommendations and Action Plans. Additionally, a more reader-friendly "Report Card" will be developed that will summarize performance trends and recommendations in easy-to-understand, lay terms.

Key Findings and Recommendations

Overall, Muni has done an excellent job of fulfilling its Proposition E mandate. Auditors found that data were accurately recorded and reported, and that reports were made available to the public and reviewed with the Citizens' Advisory Committee and MTA Board quarterly. Performance was generally good and improved over time; although there are some areas that will require specific attention in order to achieve established performance goals.

The auditors also identified a number of opportunities to further streamline and improve the Service Standards in order to make them more relevant to the public, the MTA Board and Muni management. Data do not always yield the type of information that decision makers can use to develop plans and actions that will enable improvements in performance. Our recommendations and Action Plans focus on ways that Muni can amend definitions or methods of measurement and performance goals so that the service standards can provide information that will serve as a truly useful management tool. In some cases, we recommend eliminating service standards that fail to provide truly useful information, since there is no point in collecting data if it cannot be transformed into useful information.

Following is a summary of the key findings and recommendations of this report:

A. System Reliability

- To improve on-time performance and meet the goals established under Service Standard 1a, it will be necessary to reduce the incidence of early/sharp operations. It may also be necessary to make schedule and route revisions on those lines that have chronically poor performance.
- For Service Standards 1a and 6a, it may be advantageous to reallocate resources used to perform terminal checks so that a greater number of line checks can be made. The goal of such a reallocation would be to increase the frequency of checks in order to provide additional seasonal/quarterly observations on each mode. This does not suggest that terminal leaving times are unimportant to reliability, but rather that counts could be more effectively taken elsewhere on the line.
- For Service Standards 1a and 6a, Muni should consider measuring *on-time performance* (schedule adherence) only for those services with headway intervals of more than 10 minutes, and measure *headway adherence* (time between transit vehicles) on those services with headway intervals of 10 minutes or less.
- In order to achieve established goals for the percentage of scheduled service hours that are delivered in Service Standard 2a, it will be necessary to address the loss of service due to operator unavailability. It would be prudent for Operations Managers to draft a plan to consider reallocation of operator resources between modes in order to equalize any missed service systemwide. It is probable that specific shortages in operator availability in any single mode will not be addressed in a systemwide target but should be minimized on a mode and division basis. Notwithstanding labor agreements and past practices, Operations Managers should take all necessary steps to maintain the highest levels of on-street service provision when there are spikes in operator availability.
- Service Standard 3a should be eliminated since it is simply the inverse of Service Standard 2a and is completely duplicative.
- Service Standard 4a should be coordinated with Service Standard 5a so that all lines identified as exceeding 85% of capacity during peak periods are monitored as part of Service Standard 4a. Additional data available through the Passenger Service Reports database should be utilized to conduct follow-up traffic checks on lines chronically identified as having pass-ups or peak period loads that exceed 85% of capacity.

- For Service Standard 6a, the method of measuring headway adherence should be modified so that it is more relevant to high frequency service (headway intervals of 10 minutes of less).

B. System Performance

- For Service Standard 1b, realistic goals for ridership should be established based on economic conditions as well as available service.
- Fare revenue is an important management tool that can serve as a surrogate for ridership during periods of fare stability. Combined with other indicators, it is possible to calculate average fare per passenger, a useful management tool when looking at alternative fare structures. Wile this indicator should be continued, the current practice of changing the benchmark for fare revenue annually based on the prior year's actual experience does not allow for reasonable comparison across time. Rather than continuing to alter the benchmark, it is recommended that the milestone be restated:"Fare revenue should increase by 1.5% per year compared with prior year performance." Changing the milestone in this way will allow for comparisons over time, and will serve as a better indicator of the need to adjust fares and fare structure.
- Miles and hours of service are a direct reflection on the available budget. It is not reasonable to expect that in times of budget constraints miles and hours of service will continue to increase, or even remain constant. Miles and hours of service are important inputs to the National Transit Database (NTD) reporting, and will be calculated annually whether or not they continue to be used as a performance measure. However, it is recommended that this NOT be continued as a service standard at this time.
- The goal and information presented for Service Standard 4b has limited value to the public or to Muni itself. In fact, Muni has no opportunity to exceed its budget without receiving a supplemental appropriation, as a City agency cannot operate in deficit. Rather than comparing expenses to budget by mode, which is an artificial comparison, it is recommended that Muni track fully allocated costs per hour of service by mode. This standard industry benchmark would allow Muni to compare its unit costs against other similar properties nationwide. This information is calculated by the Finance Department regularly for the NTD report, and would not require additional effort.

C. Staffing Performance

- For Service Standard 1c, the great majority of vacancies cannot be filled due to budgetary policies. In order to ensure that service provision does not suffer, Muni has focused on making sure that maintenance and operator positions are filled. Consequently, the auditor recommends that this Service Standard be limited to Transit Operators and Maintenance personnel, or that the goals for other divisions (exclusive of Transit Operators and Maintenance personnel) be revised so that they be reasonably met given budgetary constraints.
- In order to track the attrition rate for new hires in Service Standard 2c, attrition rates should either be reported at the end of new employees' probationary periods or within one year after hire. To calculate attrition, only those employees who separate after six months or one year of service should be counted. Furthermore, there is no information provided in this measure about why employees are voluntarily separating from Muni service. If it is possible to obtain this information from the Position Control System database, then it should also be summarized and included in this measurement.

D. Customer Service

- For Service Standard 1d, marketing priorities should be made within budget constraints and with the goal of increasing patronage; data from ridership surveys should be used to evaluate the success of marketing efforts.
- For Service Standard 2d, the current process of schedule preparation is cumbersome, time consuming, and relies on the background and knowledge of one key staff person. The capabilities of the new Trapeze software should be fully utilized in order to simplify and streamline the process of schedule preparation.
- For Service Standard 3d, operator conduct complaints need to be more clearly measured and reported, realistic goals for reducing the number of operator conduct complaints should be established, and the efficiency and accuracy of complaint information uptake should be improved.
- To be truly useful, Service Standard 5d should be divided into two goals to distinguish between routine information provided in real time and longer-term information provided as part of service or schedule change and/or construction projects. To further differentiate between immediate information provided to passengers on the system during delays or other unusual events, and longer-term information provided to address construction or other longer-term events the following systems of measurement are recommended:

Goal:	Improve Real-Time Passenger Information regarding service delays.
Purpose:	Provide the public with information regarding service delays that will enable them to make choices about their trip.
Definition of Measurement:	Improve passenger information by communication of service problems and other information to each vehicle, the station platforms, the Telephone information Center, media, the Service Hotline, and Service Quality Teams. Operators will make passenger announcements in all cases where service delays exceed 3 minutes in the subway and 10 minutes on surface lines. Central Control will make both visual and verbal announcements in all stations where service delays exceed 3 minutes on all LRV lines. Service Quality Teams will be assigned to all unscheduled service disruptions exceeding two hours.
Method of Measurement:	Central Control logs. Passenger Satisfaction Surveys.
Milestones:	95% of all delays of 3 minutes or more reported via station address system.Service Quality Teams assigned to all unscheduled service disruptions exceeding 2 hours. 75% of all passengers returning surveys indicate that information regarding service delays is adequate and useful.

- In order to meet the accident reduction goals established in Service Standard 6d, it will be necessary to develop a comprehensive approach and coordinated effort to reduce accidents across divisions and departments. Driver training was found to be sufficient. Therefore, the focus of accident reduction efforts should be enforcement of safety rules and procedures and accident prevention through thorough review of all accidents.

E. Employee Satisfaction

- In addition to the Employee Satisfaction Service Standards, Muni is also measuring employee satisfaction via its annual Employee Survey. The results of this survey should be incorporated into this group of service standards since, in many respects, it provides a better measure of employee satisfaction than the current group of service standards.
- For Service Standard 1e, a goal or benchmark for the number and type of grievances should be established so that management can more effectively monitor changes in grievance rates.
- For Service Standard 2e, the method for reporting speed of resolution of grievances for non-operator grievances needs to be closely examined and monitored to ensure that information is reported correctly in the future.
- Service Standard 3e provides almost no information about employee satisfaction. If anything, it is more a measure of staffing performance, since long-term employees (and relatively minimal staff turnover) reduce the need to hire and train new employees. The auditor therefore recommends that this measure be eliminated from the Service Standards Report, or, if retained, moved to the Staffing Performance section.
- For Service Standard 4e, the actual number and type of annual and quarterly awards made should be included in the Service Standards Report.
- For Service Standard 5e, all employee training hours should be tracked in some type of centralized system in order to facilitate future reports and audits.

A. System Reliability

This group of service standards measure system reliability – the extent to which transit vehicles arrive, depart and are able to accommodate all passengers at expected times and frequencies. System reliability is the most significant factor in attracting choice riders, as riders are unlikely to depend on a system that is unreliable. Poor system reliability can significantly lengthen the amount of time passengers spend both waiting for a transit vehicle and traveling to their final destination. It can also result in crush loads and pass ups, where transit vehicles are at capacity and unable to accommodate waiting passengers. This situation often leads to further delays and breakdowns in service reliability.[1]

Proposition E specified the following service standards in order to improve and maintain the reliability of Muni transit service. Collectively, these performance measures give on-going snapshots and the ability to diagnose service delivery problems.

- 1a. % of vehicles that run on time according to published schedules (no more than 4 minutes late or 1 minute early) measured at terminals and established intermediate points.
- 2a. % of scheduled service hours that are delivered and percentage of scheduled vehicles that begin service at the scheduled time.
- 3a. Missed service due to either insufficient vehicles or driver unavailability as a percentage of scheduled service hours. (This is simply an inverse of the preceding service standard.)
- 4a. % of vehicles that pass published time points during measurement periods unable to pick up passengers due to crowding without being followed within 3 minutes or less by another vehicle on the same route with space for all waiting passengers.
- 5a. Peak period passenger load factors.
- 6a. Actual headways against scheduled headways on all radial, express, cross-town, secondary, and feeder lines for peak, base, evening, and late night services.
- 7a. % vehicle availability and reliability (mean distance between failure) by mode.
- 8a. Unscheduled absences by operator, mechanical and administrative personnel.
- 9a. Miles between roadcalls by mode.

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[1] Transit Capacity and Quality of Service Manual" (TCQSM), Second Edition, *TCRP Report 100*, 2003, p. 3-18 http://www4.trb.org/trb/onlinepubs.nsf/web/tcrp)report_100

Key Recommendations

The following are key recommendations based on the findings of our audit of FY2001 and FY2002 Service Standards data and on trends observed in unaudited FY2003 and FY2004 Service Standards data:

- To improve on-time performance and meet the goals established under Service Standard 1a, it will be necessary to reduce the incidence of early/sharp operations. It may also be necessary to make schedule and route revisions on those lines that have chronically poor performance.
- For Service Standards 1a and 6a, it may be advantageous to reallocate resources used to perform terminal checks so that a greater number of line checks can be made. The goal of such a reallocation would be to increase the frequency of checks to provide additional seasonal/quarterly observations on each mode. This does not suggest that terminal departure times are unimportant to reliability, but rather that counts could be more effectively taken elsewhere on the line.
- For Service Standards 1a and 6a, Muni should consider measuring on-time performance (schedule adherence) only for those services with headway intervals of more than 10 minutes, and measure headway adherence (time between transit vehicles) on those services with headway intervals of 10 minutes or less.
- In order to achieve established goals for the percentage of scheduled service hours that are delivered in Service Standard 2a, it will be necessary to address the loss of service due to operator unavailability. It would be prudent for Operations Managers to draft a plan to consider reallocation of operator resources between modes in order to equalize any missed service systemwide. It is probable that specific shortages in operator availability in any single mode will not be addressed in a systemwide target but should be minimized on a mode and division basis. Notwithstanding labor agreements and past practices, Operations Managers should take all necessary steps to maintain the highest levels of on-street service provision when there are spikes in operator availability.
- Service Standard 3a should be eliminated since it is simply the inverse of Service Standard 2a and is completely duplicative.
- Service Standard 4a should be coordinated with Service Standard 5a so that all lines identified as exceeding 85% of capacity during peak periods are monitored as part of Service Standard 4a. Additional data available through the Passenger Service Reports database should be utilized to conduct follow-up traffic checks on lines chronically identified as having pass-ups or peak period loads that exceed 85% of capacity.
- For Service Standard 6a, the method of measuring headway adherence should be modified so that it is more relevant to high frequency service (headway intervals of 10 minutes or less).

1a. % of vehicles that run on time according to published schedules (no more than 4 minutes late or 1 minute early) measured at terminals and established intermediate points.

Goal:	No less than 85% on July 1, 2004
Purpose:	To measure schedule adherence
Definition of Measurement:	**FY2001:** Monthly measurement of the 5 most patronized routes for each division. Such checks shall be conducted no less often than 10 weekdays and weekends per month on 5 different routes per month in each division, beginning with the most patronized route, progressing in the order of declining route patronage, and ending with the least patronized route. The cycle shall then be repeated. **FY2002:** Each line will be checked twice a year. Such checks shall be conducted no less often than 10 weekdays and weekends per check. An annual checking schedule shall be established for the routes. The order in which the routes are checked will be determined monthly through a random selection process. To the extent automated systems can be substituted at less cost for such checks, or the measurement of any performance standard, such systems must be used.
Method of Measurement:	Check the designated lines using criteria of -1 minute to +4 minutes. "Periods of time includes morning rush (6 a.m. to 9 a.m.) midday (9 a.m. - 4 p.m.) evening rush (4 p.m. to 7 p.m.) and night (7p.m. to 1 a.m.). Supervisory personnel shall conduct a one-hour, on-time, and load standard check at a maximum load point at mid-route during all four time periods stated above."
Milestones:	FY2001 FY2002 65% 70%

From *Muni Service Standards Report, FY2001 and FY2002*

Reported Performance

Table A-1 summarizes the quarterly results by mode for fiscal years 2001, 2002, 2003 and the first quarter of fiscal year 2004. The jump in performance for the light rail and cable car modes between the third and fourth quarters of FY2001 was due to a change in measurement procedure. Beginning in the fourth quarter of FY2001, scheduled arrival times were no longer linked to scheduled run numbers for cable car and light rail modes. Instead, checks were made to determine whether any vehicle, rather than a specific run number, arrived at scheduled times. (This change was approved by the MTA Board.) The original FY2002 goal was lowered from 75% to 70%. Consequently, the established goal was met for both FY2001 and FY2002 for systemwide, fourth quarter performance.

Subsequent to the audit period, on-time performance held steady in FY2003 (unaudited figures) but failed to meet the 75% on-time standard and appears to have declined in the first quarter of FY 2004.

Table A-1 On-Time Performance, FY2001 – FY2004

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	FY Goal
FY2001 On-Time Performance					
Motor Coach	58.6%	60.3%	68.3%	67.8%	65%
Trolley	61.8%	65.1%	61.9%	66.1%	
Light Rail	42.9%	45.5%	42.5%	63.0%	
Cable Car	18.0%	18.3%	17.3%	67.2%	
Systemwide	50.2%	53.4%	50.6%	65.5%	
FY2002 On-Time Performance					
Motor Coach	65.1%	69.4%	68.6%	69.9%	70%
Trolley	71.6%	76.1%	71.3%	76.1%	
Light Rail	59.8%	65.1%	67.7%	67.8%	
Cable Car	68.7%	67.0%	**	70.9%	
Systemwide	66.9%	70.9%	69.5%	71.9%	
FY2003 On-Time Performance					
Motor Coach	*70.4%*	*68.8%*	*67.2%*	*71.3%*	75%
Trolley	*73.1%*	*74.6%*	*74.6%*	*73.5%*	
Light Rail	*64.3%*	*66.6%*	*66.9%*	*69.1%*	
Cable Car	*69.9%*	*72.6%*	*68.2%*	*67.0%*	
Systemwide	*70.1%*	*70.7%*	*70.0%*	*70.9%*	
FY2004 On-Time Performance					
Motor Coach	*69.4%*				85%
Trolley	*68.8%*				
Light Rail	*62.5%*				
Cable Car	*66.0%*				
Systemwide	*67.3%*				

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004

Data in italics have not been audited

** Was not measured this quarter.

Verification of Definition and Method of Measurement During the Audit Period

FY2001

The following changes in sampling methodology were approved by the MTA Board and subsequently implemented in FY2001:

- Light rail (LRV) and cable car divisions were combined into one rail sampling rotation with results reported separately; eight checks per month were reduced to five or four checks per month.
- Three motorcoach divisions were combined into one motorcoach sampling rotation; 15 checks per month were reduced to five checks per month.
- Two trolleycoach divisions were combined into one trolleycoach sampling rotation; ten checks per month were reduced to five checks per month.

Lines were sampled within each mode according to ranked patronage as described in the definition of measurement. At least ten weekday checks were performed during each month for motor coach and trolley coach modes. Light rail and cable car modes were in compliance with the definition of measurement for the months they were sampled. All time periods were sampled in accordance with the definition and method of measurement.

FY2002

The selection of routes was coordinated with the Data Collection Plan (DCP), adopted by Muni to satisfy the annual NTD (and previously UMTA/FTA Section 15) ridership reporting. The FY2001 methodology for sampling 15 lines/checks per month was modified for FY2002 to include nine motorcoach lines, three to four trolleycoach lines, and two to three rail lines. A random selection process replaced the ranked ridership rotation process. Specific locations and time periods conformed to the DCP and included, as a minimum, the Prop E defined time periods.

Verification of Reported Performance During the Audit Period

Based on an audit of the fourth quarter FY2001 and FY2002 submittals by the Muni Analysis Coordinator, performance appears to have been reported correctly during the audit period.

Problems or Issues Identified During the Audit Period

While there were no specific problems or issues with reported performance or the method or definition of measurement, a more detailed analysis of performance for specific lines identified several important issues. An analysis of the schedule adherence reporting over FY2001 and FY2002 shows some continuing trends in those individual routes/lines with the poorest results. The following table highlights cumulative findings for the poorest performing lines by mode:

Table A-2 Poorest Performing Lines for On-Time Performance, FY2001 – FY2002

Motor Coach Lines	2001 <50% on-time	2001 <65% on-time >10% early	2002 <50% on-time	2002 <70%on-time >10%early
98X		X		
15		X		
17	X	X		X
19	X	X		
26	X			X
29				X
27		X		
36		X		X
38AX				X
54	X	X	X	X
76	X	X		
80X		X		
81X	X	X	X	
82X		X		
89	X	X		X

Trolley Coach Lines	2001 <50% on-time	2001 <65% on-time >10% early	2002 <50% on-time	2002 <70%on-time >10%early
14		X		
21		X		

Light Rail Lines	2001 <50% on-time	2001 <65% on-time >10% early	2002 <50% on-time	2002 <70%on-time >10%early
49		X		
J	X	X		X
K	X	X		
J	X	X		
M	X	X		X
N	X	X		

Cable Car Lines	2001 <50% on-time	2001 <65% on-time >10% early	2002 <50% on-time	2002 <70%on-time >10%early
59	X	X		X
60	X	X		X
61	X	X		

From the FY2001 and FY2002 Findings Report submitted by the Analysis Coordinator

The systemwide schedule adherence standard cannot reasonably be attained without specific corrective action to the poorest-performing lines. Given current trends, it is improbable that the attainment of 85% schedule adherence will be reached in FY2004. When examined further, the auditor found that failure to meet on-time performance was due in large part to early arrivals.[2] This is encouraging, since many delays in service result from street conditions that are beyond Muni's control. Early departures result from many causes, and may be cultural, behavioral, or intentional – but most of the causes are entirely within Muni's control. If early/sharp operation is dramatically curtailed, then achievement of 85% on-time performance could be possible for all modes.

In FY2001, for the 81 lines for which on-time performance was reported, all had a minimum of 3% early/sharp observations, with an average of 17.1% early/sharp for motor coach, 14.9% early/sharp for trolley coach, 36.4% early/sharp for light rail, and 32.2% early/sharp for cable car. All of the early arrivals cited above were at least 2 minutes or more ahead of schedule.

In FY2002, for the 80 lines for which on-time performance was reported, all but one had a minimum of 3% early/sharp observations, with an average of 18.9% early/sharp for motor coach, 14.4% early/sharp for trolley coach, 23.0% early/sharp for light rail, and 17.2% early/sharp for cable car. While systemwide on-time performance improved by 14.5%, the improvement in early/sharp arrivals was less dramatic – only 6.6%. Additionally, it appears that for the rubber tire combined motor coach and trolley coach modes, incidence of early/sharp operation actually *increased* from 15.6% to 16.7%. It should be noted that improvement in the rail modes in both on-time achievement and reduction of early/sharp observations was due primarily to the change in measurement method cited earlier.

Muni staff have recognized that early/sharp arrivals are a significant impediment to achieving on-time performance goals and have taken the following steps in order to address this and other on-time performance problems:

- Street Inspectors will be deployed at terminals (to the extent possible) to insist on schedule adherence and prevent early departures. In order to make the best use of the limited number of Street Inspectors, Inspectors will now be responsible for checking multiple modes at key transfer points.
- Responsibility for on-time performance will be more heavily focused at the division level. Division Managers will have fewer administrative duties and will be able to concentrate more on directly overseeing Street Supervisors.
- Schedules will be reviewed to make sure they properly coincide with running times.
- Next Bus technology will be used to monitor the on-time performance of certain lines in real time so that Street Inspectors can make necessary adjustments before more significant on-time problems arise.
- Muni will continue to work closely with the Department of Parking and Transportation to clear busways more quickly.
- Daily discussions and reviews of safety and on-time performance with operators, Central Control, and Street Inspectors will continue. Muni staff will also continue to meet with union representatives in order to obtain their support for meeting on-time performance goals.
- An education and incentive campaign is planned that will inform transit operators about on-time performance goals and actual achievement, and will reward those operators who have best on-time performance.

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[2] Early running is a significant contributor to failures to meet on-time performance goals for other transit agencies as well. Ibid., p. 3-46.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, the MTA adjusted the Definition of Measurement for FY2004 by changing the first sentence to read, "Each line will be checked at least once in each six-month period."

Action Plan

Given the continued need for on-time performance improvement, the recommendations in this Action Plan focus on early arrivals and on corrective actions for the poorest performing routes. The trends in data observed for Service Standards 1a and 6a (actual headways against scheduled headways) concurrently require both on-street attention to supervision and preparation of new schedules. The modal matrix under "Problems or Issues Identified" identifies lines with the highest priority for both schedule evaluation/ remediation and supervision.

Incidence of Early/Sharp Observations

Attention should be directed to reducing the incidence of early/ sharp operation and thereby increasing dramatically the on-time performance. Findings for both audit years are significant:

Mode	FY2001 On-Time	FY2002 On-Time	FY2001 Early/Sharp	FY2002 Early/Sharp
Motor Coach	62.8%	68.4%	17.1%	18.9%
Trolley Coach	63.8%	73.9%	14.9%	14.4%
MC + TC	63.4%	71.0%	15.6%	16.7%
Light Rail	49.0%	65.6%	36.4%	23.0%
Cable Car	35.8%	69.1%	32.2%	17.2%
Systemwide	55.4%	69.9%	24.5%	17.9%

From the FY2001 and FY2002 Findings Report submitted by the Analysis Coordinator

Given the Proposition E measurement definition for schedule adherence that allows a window of +1/-4 for attaining "on-time" status, those percentages of early/sharp cited above exceeded the +1 allowance by a significant amount. All such observations were at least 2 minutes or more ahead of schedule. To evaluate schedule adequacy (i.e., to measure the degree of appropriate running time), recovery time, and headway (capacity), ahead of schedule (early/ sharp) operation must be curtailed. Significant on-street supervisory resources must be deployed to monitor and manage both end terminal departures and mid-point timepoint schedule adherence. It is apparent that if early/sharp operation is curtailed, then achievement of 85% on-time performance is within target in all modes.

Schedule Evaluation/Remediation

Muni is fortunate to have an in-house Data Collection Plan that incorporates NTD Passenger Boarding/Ridership sampling with Proposition E system reliability performance sampling. Muni's commitment to adhere to the Data Collection Plan enables periodic updating of boarding data for each route/line as well as timepoint-level running time data. To that end, new baseline data are collected each quarter for several lines across various modes. The auditor identified 26 lines that incurred less than 65% on-time adherence and greater than 10% early/sharp arrivals. The extent to which those lines have received baseline updates and analysis is as follows:

Line	FY2002 SchAdh%	Baseline Pre FY01	Baseline FY01&02	Baseline FY03&04	Analysis Complete	Running Time Problem
9BX MC	70.2	4/98		3/04	4/04	
15	66.1	1/96		2/04	3/04	
17	51.3		8/02		9/02	Yes
19	69.0		9/01		10/01	No
26	57.4		12/01		5/02	Yes
27	68.5		8/02		10/02	Yes
29	58.6		1/02		2/02	Yes
36	62.1	1/99			3/00	No
38AX	56.4		8/02		9/02	No
54	45.5	3/93		4/04	6/04	
76	61.7					
80X	56.9			9/03	2/04	
81X	39.8			9/03	2/04	
82X	57.0			9/03	1/04	
89	59.0			2/03	2/04	
14 TC	71.5		12/02		1/03	Yes
21	73.7		12/00		3/01	Yes
49	70.6			1/03	1/03	Yes
J LRV			10/00		3/01	Yes
K				6/04	11/04	
L				3/05	10/05	
M				12/04	7/05	
N				8/04	7/04	

From findings submitted by the Analysis Coordinator

Analysis of baseline data by the Analysis Coordinator within the Schedules Department has been an on-going function. Those lines identified with *deficient* running time/recovery time have been quantified. The required vehicle hours and peak-to-base vehicles to implement a new schedule and remedy deficiencies are as follows:

Line	Service	Vehicle Hrs/Day	Peak Vehicles	Base Vehicles	5-Day Runs	Pay Hrs/ Day
26 MC	Wk	4	Yes	No	1	
29 MC	Wk	12	Yes	Yes	2	
MC	**Wk**	**16**	**2**	**1**	**3**	**19**
14 TC	Wk	8	Yes	Yes	1	
21 TC	Wk	16	Yes (2)	Yes	2	
TC	**Wk**	**24**	**3**	**2**	**3**	**28**
Daily Total		***40***	***5***	***3***	***6***	***47***
Annual Total*		***10,120***				***11,891***

From findings submitted by the Analysis Coordinator.

*Based on 253 weekdays during the year.

Annualized platform (operator) costs for those target lines listed above would be approximately $378,000. Variable costs for maintenance and possibly capital costs for added peak vehicles have not been estimated.

Route Evaluation

Route length (one-way mileage) and enroute turns/congestion points are a source of on-going schedule conflict. Evaluation of each low-performing route for schedule deficiencies should likewise include route segment analysis to determine how significant congestion points contribute negatively to schedule adherence. If any congestion point contributes more than 10% one-way running time variability, then it is assumed that recovery time will be insufficient to cover this condition and enroute schedule adherence will exceed the on-time window. Several options are available for remediation:

- Add a "**control point**" mid-route where significant congestion has occurred prior. The control point should preferably be at a major transfer/generator location.
- Consider **segmenting** the line where prevailing demands on both ends are not matched and the costs of adding recovery time for two new termini is **offset** by the headway changes/ cycle time reduction on one segment.
- Consider **route deviations** when congestion occurs at specific locations during specific time periods.
- Consider preferential right-of-way/**transit lane** designation where specific congestion occurs during specific time periods. (All transit preferential signal treatments, including signal pre-emption, should be identified).

Targeted Improvements

Implementing a comprehensive and on-going schedule revision program is the mission of all schedule departments; however, operational needs and resource constraints often preclude this regularized approach to maintaining effective operating schedules. Although the specific lines identified previously as under-performing may be prioritized for both supervision and new schedules, they individually may not add on-time improvement sufficient to raise both the modal and systemwide percentage significantly. For example, the motorcoach 89 line attaining 90% on-time status versus the current (FY2002) 80% would not contribute as much as the motorcoach 47 attainment of a similar 10% improvement (FY2002 on-time at 55%). However, collectively the 15 under-performing motorcoach lines, if improved up to 85%, would contribute to a 6% improvement in the mode from 68.4% to 74.5%.

Prioritizing light rail (LRV) for reduction of early/sharps by 15% (from 23 % to 8%) would move 1,612 observed trips to on-time attainment, and significantly raise the LRV mode to 80.6%. Similarly, prioritizing cable car to meet scheduled headways (observed trips and not runs currently are reconciled to scheduled times) throughout the day would significantly raise on-time attainment from 69.1% to at least 85%. Note that the on-time window of +1/-4 applies to the day base scheduled headway of 8 minutes.

Sampling Resources –
Reallocation of Terminal Checking to Increased NTD Checking

Once early departures from terminals is no longer a significant problem, it may be appropriate to eliminate terminal checks so that a greater number of line checks can be performed. Although the Proposition E measurement requirement included checks at terminals and established timepoints, the checking resources expended to collect from terminals is about twice that required for established/intermediate timepoints. The Proposition E mid-point sampling plans are coordinated with Muni's NTD sampling plans to minimize the checking resources expended. The Data Collection Plan for FY 2002/2003 (August 1, 2002) indicates that 9,720 hours per year of checking is required for the Proposition E program at 4.5 locations per line. Additionally, 3,432 hours per year of checking is required for the NTD program at two locations per line. Clearly, a significant 74% of the combined programs is allocated to Proposition E.

The resulting difference in schedule adherence (between terminals and intermediate timepoints) is only about 1%, however. Thus, while checking terminals provides a validation of the checks at intermediate timepoints and identifies trips that leave the terminal off-schedule, actual results indicate that such a validation may not be necessary. It would appear prudent to increase the sampling of intermediate timepoint checks in lieu of the terminal checks with the goal of sampling each line each quarter rather than the current twice yearly target.

The auditor recommends that the portion of Proposition E checking hours allocated to terminal checks (roughly 4,320 hours per year) be reallocated to mid-point locations. The goal of such a reallocation would be to increase the frequency of checks to provide additional seasonal/quarterly observations on each mode. Poorly performing routes should be targeted for additional observations as well. If the approximately 4,320 hours currently allocated to terminal checks were reallocated to the current NTD program of 3,432 hours, it would more than double the frequency of checks made under the NTD program.

Streamlining the Service Standards

On-time performance is typically used to measure the reliability of transit services operating at headways that are greater than 10 minutes. For services operating at headways of 10 minutes or less, headway adherence is typically used to measure service reliability.[3] From a passenger's perspective, schedule adherence matters when headways are longer than 10 minutes, since passengers rely on scheduled arrivals and departures when planning their trips. For headways that are 10 minutes or less, passengers no longer rely on schedules, since they know a vehicle will arrive shortly after they arrive at their stop. Service reliability might be more accurately measured by *not* measuring on-time performance for high frequency (headway intervals of 10 minutes or less) transit services, but by measuring headway adherence instead (see the "Action Plan" section under Service Standard 6a).

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[3] Ibid., p 3-47

Coordination with Other Goals and Objectives

On-time performance is closely related to the other performance goals within this group of service standards. The steps taken to improve on-time performance should be closely coordinated with actions taken to achieve other performance measures, particularly those related to headway adherence (6a), delivery of scheduled service (2a) and safety (6d).

Use of Cumulative, Annual Performance vs. Quarterly Performance

Rather than using fourth quarter results to determine achievement of annual goals, the auditor recommends that cumulative or average annual performance be used instead. There are a number of internal and external factors that lead to substantial variation in performance between quarters, including the fact that different lines are sampled each year during the fourth quarter. Reporting year-to-date or cumulative annual performance may provide a better picture of systemwide and modal performance over the entire year. Quarterly performance could still be used to determine variations in progress toward meeting performance goals throughout the year. Following are both the fourth quarter and year-to-date performance systemwide and for individual modes in FY2001 and FY2002.

Mode	FY2001		FY2002	
	4th Quarter	Year-to-Date	4th Quarter	Year-to-Date
Motor Coach	67.8%	62.8%	69.9%	68.4%
Trolley Coach	66.1%	63.8%	76.1%	73.9%
Light Rail	63.0%	49.0%	67.8%	65.6%
Cable Car	67.2%	35.8%	70.9%	69.1%
Systemwide	65.5%	55.4%	71.9%	69.9%

2a. % of scheduled service hours that are delivered and percentage of scheduled vehicles that begin service at the scheduled time.

Goal:	No less than 98.5% on July 1, 2004		
Purpose:	To measure service hours through available operators and available equipment, along with the percentage of equipment available for service.		
Definition of Measurement:	Monthly measurement of the percent of total available hours for service measuring operators and equipment and percentage of equipment available daily.		
Method of Measurement:	Both operators and equipment are measured as to the total number of hours in service as a percentage of the total scheduled hours. Data come from the online Dispatching System. Measurement of the vehicles that begin service at the scheduled time will be provided from the 8 a.m. and 6 p.m. 'Not-Out Report' generated by Central Control and will show the percent of vehicles that went out at the scheduled time for both the a.m. and p.m. pullout.		
Milestones:	FY2001 96.5%	FY2002 97%	(% of scheduled service hours delivered)

From *Muni Service Standards Report, FY2001 and FY2002*

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni adjusted the milestones for scheduled service hours. The FY2003 and FY2004 milestones were:

- FY2003 – 97.5%
- FY2004 – 98.5%

Action Plan

Develop a Plan for Maximizing Service Provision During "Low Availability Periods"

The milestone targets adopted by MTA for FY2001 and FY2002 for this service standard were consistent with achieving the FY2004 attainment of "No less than 98.5% of service hours delivered on July 1, 2004." The progress between FY2001 of 94.53% systemwide service hours delivered to FY2002 of 97.80% of systemwide service hours delivered was significant. However, unaudited fourth quarter results from FY2003 do not indicate that progress is continuing, since only 94.52% of scheduled service hours were delivered systemwide.

It is realistic to assume that in the future MTA will experience various "spikes" in operator availability due to changes in the rates of Claiming Industrial and Claiming Industrial for Assault (i.e., operator absences due to workers compensation) and fluctuations in the hiring process due to potential cuts in support services. It would be prudent that Operations Managers draft a plan to consider reallocation of operator resources between modes in order to equalize any missed service systemwide. It is probable that specific shortages in operator availability in any mode will not be addressed in a systemwide target but nonetheless should be minimized on a mode and division basis. Notwithstanding labor agreements and past practices, Operation Managers should take all necessary steps to maintain the highest levels of on-street service provision when there are spikes in operator availability.

Use of Cumulative, Annual Performance vs. Quarterly Performance

Rather than using fourth quarter results to determine achievement of annual goals, the auditor recommends that cumulative or average annual performance be used instead. There are a number of internal and external factors that lead to substantial variation in performance between quarters. Reporting year-to-date or cumulative annual performance may provide a better picture of systemwide and modal performance over the entire year. Quarterly performance could still be used to determine variations in progress toward meeting performance goals throughout the year.

3a. Missed service due to either insufficient vehicles or driver unavailability as a percentage of scheduled service hours.

Goal:	No less than 1.5% on July 1, 2004
Purpose:	To measure service hours through available operators and available equipment.
Definition of Measurement:	Monthly measurement of the percent of total available hours for service measuring operators and equipment and percentage of equipment available daily.
Method of Measurement:	Both operators and equipment are measured as to the total number of hours in service missed as a percentage of the total scheduled hours. Data comes from the online Dispatching System.
Milestones:	FY2001 FY2002 3.5% 3% (% of scheduled service hours delivered)

From Muni Service Standards Report, FY2001 and FY2002

Reported Performance

This service standard is the inverse of Service Standard 2a. Rather than the percent of scheduled service hours that are delivered, this service standard reports the percent of scheduled service hours that are missed as a result of insufficient vehicles or driver unavailability.

At the end of FY2001, Muni was unable to meet its goal of no more than 3.5% of scheduled service hours missed, either systemwide or for any particular mode or division, except for the Kirkland motor coach division. Missed hours were due primarily to unavailability of operators, rather than equipment. There was significant improvement in FY2002, however, and the goal of no more than 3% of scheduled service hours missed was met for most divisions (except cable car) and systemwide.

Any improvement gains appear to have been lost in FY2003, since the goal was not met by any of the divisions or systemwide. First quarter results for FY2004 do not indicate much improvement. Table A-5 summarizes the fourth quarter for fiscal years 2001, 2002 and 2003 and the first quarter results for FY2004.

Table A-5 Percentage of Missed Service, FY2001 – FY2004

	4th Quarter FY2001			4th Quarter FY2002			4th Quarter FY2003			1st Quarter FY2004		
	FY2001 Goal: 3.5%			FY2002 Goal: 3%			FY2003 Goal: 2.5%			FY2004 Goal: 1.5%		
	% Hrs Missed due to Operator Unavailable	% Hrs Missed due to Equipment Unavailable	% of Total Scheduled Hours Missed	% Hrs Missed due to Operator Unavailable	% Hrs Missed due to Equipment Unavailable	% of Total Scheduled Hours Missed	% Hrs Missed due to Operator Unavailable	% Hrs Missed due to Equipment Unavailable	% of Total Scheduled Hours Missed	% Hrs Missed due to Operator Unavailable	% Hrs Missed due to Equipment Unavailable	% of Total Scheduled Hours Missed
Motor Coach	5.10%	0.24%	5.34%	1.90%	0.05%	1.95%	*5.42%*	*0.03%*	*5.46%*	*3.98%*	*0.15%*	*4.12%*
Flynn	6.77%	0.79%	7.56%	1.69%	0.05%	1.74%	*6.59%*	*0.08%*	*6.66%*	*5.79%*	*0.15%*	*5.94%*
Woods	5.34%	0.10%	5.44%	2.30%	0.09%	2.38%	*6.45%*	*0.01%*	*6.45%*	*4.47%*	*0.20%*	*4.67%*
Kirkland	3.48%	0.00%	3.48%	1.50%	0.01%	1.51%	*3.19%*	*0.03%*	*3.23%*	*1.91%*	*0.07%*	*1.99%*
Trolley	5.09%	0.10%	5.19%	1.46%	0.39%	1.85%	*2.40%*	*0.12%*	*2.52%*	*2.20%*	*0.09%*	*2.29%*
Potrero	5.02%	0.18%	5.20%	2.19%	0.07%	2.26%	*1.97%*	*0.15%*	*2.13%*	*3.23%*	*0.17%*	*3.39%*
Presidio	5.18%	0.01%	5.18%	0.57%	0.77%	1.34%	*2.92%*	*0.09%*	*3.01%*	*1.06%*	*0.01%*	*1.07%*
LRV	4.70%	1.22%	5.91%	1.75%	0.11%	1.86%	*5.48%*	*0.021%*	*5.69%*	*3.30%*	*0.48%*	*3.78%*
Cable Car	7.55%	0.05%	7.60%	7.93%	0.25%	8.18%	*26.38%*	*0.30%*	*26.68%*	*9.72%*	*0.15%*	*9.87%*
Systemwide	5.15%	0.31%	5.47%	2.02%	0.18%	2.20%	*5.37%*	*0.10%*	*5.48%*	*3.54%*	*0.19%*	*3.73%*

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*

Data in Italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

During the audit period, data were entered on a daily basis into the Automated Dispatch system by the division dispatchers. The dispatchers followed regularized procedures for showing runs without a driver assignment and/or without equipment available. Division Managers were responsible for reviewing automated dispatch data.

The Automated Dispatch software provided a daily aggregation of data on operator and vehicle availability. This information was tabulated to provide monthly and quarterly assessments. The percentage availability was calculated using data from the Automated Dispatch software and scheduled service information from the Schedule Department.

Verification of Reported Performance During the Audit Period

The responsible position for performing this function was eliminated in the current FY2003-2004 budget; the function is currently performed by a manager in the scheduling section of the Operations Division. Procedural documentation for Proposition E reporting for FY2001 and FY2002 was not available. Audit verification of initial source data was accomplished by query of the Auto Dispatch system and aggregation/summarization was accomplished by manual means utilizing hard copies of weekly missed service reports. Based on this information, the percent availability of operators and equipment for FY2002 appears to have been reported correctly.

Problems or Issues Identified During the Audit Period

Other than difficulties encountered due to staff changes, no other problems or issues were identified. Although performance goals were achieved in FY2002, future performance achievement appears to be problematic.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni adjusted the milestones for missed scheduled service hours. The FY2003 and FY2004 milestones were:

- FY2003 – 2.5%
- FY2004 – 1.5%

Auditor Recommendations

This service standard should be eliminated since it is simply the inverse of Service Standard 2a. The Citizen's Advisory Committee (CAC) has also recommended that this Service Standard be removed, since it is a duplicate of Standard 2a.

4a. % of vehicles that pass published time points during measurement periods unable to pick up passengers due to crowding without being followed within 3 minutes or less by another vehicle on the same route with space for all waiting passengers.

Goal:	Less than 5%
Purpose:	To measure crowding in vehicles.
Definition of Measurement:	FY2001: Monthly measurement of the 5 most patronized routes for each division. Such checks shall be conducted no less often than 10 weekdays per month on 5 different routes per month in each division, beginning with the most patronized route, progressing in the order of declining route patronage, and ending with the least patronized route. The cycle shall then be repeated.FY2002: Each line will be checked twice a year. Such checks shall be conducted no less often than 10 weekdays and weekends per check. An annual checking schedule shall be established, with the lines to be checked each month randomly selected. To the extent automated systems can be substituted at less cost for such checks, or the measurement of any performance standard, such systems must be used.
Method of Measurement:	Check the designated lines using criteria of -1 minute to +4 minutes. "Periods of time includes morning rush (6 a.m. to 9 a.m.) midday (9 a.m. - 4 p.m.) evening rush (4 p.m. to 7 p.m.) and night (7p.m. to 1 a.m.). Supervisory personnel shall conduct a one-hour, on-time, and load standard check at a... FY2001: ...maximum load point at mid-route during all four time periods stated above.FY2002: ...maximum load point at mid-route during all four time periods stated above. Pass-ups shall be checked during such times at one stop before the maximum load point
Milestones:	FY2001 FY2002 Less than 5% Less than 5%

From Muni Service Standards Report, FY2001 and FY2002

Reported Performance

In FY2001, fewer than 0.35% of vehicles sampled passed up passengers due to overcrowding without being followed by another vehicle able to accommodate all passengers within three minutes. In the fourth quarter of FY2001, the pass up percentage was zero. In FY2002, the highest pass-up percentage was 0.71% and the lowest was 0%. Thus, in both FY2001 and FY2002, the goal of lower than a 5% pass-up rate was not only achieved but surpassed. The highest for any of the lines sampled was 5.56% for the 9AX San Bruno (November 2000) and 5.88% for the 1AX California A Express (July 2001).

The percentage of pass-ups spiked during several months in FY2003, and were relatively high for the M-Oceanview and the N-Judah during the first quarter of FY2004. Table A-6 presents systemwide pass-up results for fiscal years 2001, 2002, and 2003 and for the lines measured during the first quarter of FY2004.

Table A-6 Percent of Pass Ups (from checks at MLP for the five most patronized lines), FY2001 – FY2004

	FY2001 Average	FY2002 Average	FY2003 Average	FY2004 Average					
Month	Systemwide	Systemwide	Systemwide	M-Oceanview	N-Judah	30-Stockton	38L Geary Limited	44 O'Shaughnessy	Systemwide
July	0.15%	0.04%	*0.72%*	*4.35%*	*4.92%*	*0.00%*	*0.00%*	*0.00%*	*1.71%*
August	0.02%	0.31%	*0.00%*	*8.82%*	*5.66%*	*0.00%*	*0.00*	*0.00%*	*2.90%*
September	0.05%	0.45%	*5.49%*	*3.77%*	*10.94%*	*4.92%*	*0.00%*	*0.00%*	*4.41%*
October	0.04%	0.13%	*6.78%*						
November	0.09%	0%	*8.57%*						
December	0.35%	0.09%	*6.09%*						
January	0.03%	0.34%	*0.53%*						
February	0.04%	0.24%	*0.00%*						
March	0.10%	0.10%	*0.00%*						
April	0%	0.24%	*0.00%*						
May	0%	0.27%	*4.82%*						
June	0%	0.71%	*0.00%*						

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*
Data in italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

FY2001

The following changes in sampling methodology were approved by the MTA Board and subsequently implemented in FY2001:

- Light rail (LRV) and cable car divisions were combined into one rail sampling rotation with results reported separately; eight checks per month were reduced to five or four checks per month.
- Three motorcoach divisions were combined into one motorcoach sampling rotation; 15 checks per month were reduced to five checks per month.
- Two trolleycoach divisions were combined into one trolleycoach sampling rotation; 10 checks per month were reduced to five checks per month.

Lines were sampled within each mode according to ranked patronage as described in the definition of measurement. At least ten weekday checks were performed during each month for motor coach and trolley coach modes. Light rail and cable car modes were in compliance with the definition of measurement for the months they were sampled. All time periods were sampled in accordance with the definition and method of measurement.

FY2002

The selection of routes was coordinated with the Data Collection Plan (DCP), adopted by Muni for provision of data for internal planning purposes and to satisfy the annual NTD (and previously UMTA/FTA Section 15) ridership reporting. The FY2001 methodology for sampling 15 lines/checks per month was modified for FY2002 to include nine motorcoach lines, three to four trolleycoach lines, and two to three rail lines. A random selection process replaced the ranked ridership rotation process. Specific time periods conformed to the DCP and included, as a minimum, the time periods defined in Proposition E.

Verification of Reported Performance During the Audit Period

An audit of FY2001 and FY2002 data confirmed that pass up data was reported correctly for all but the fourth quarter of FY2001. For the fourth quarter of FY2001, zero pass ups were reported in the Service Standards Report, however source data showed that five pass ups occurred during that quarter. It is likely that updates or changes to data were not transmitted to the Superintendent of Performance Monitoring and Analysis.

For the second, third and fourth quarters of FY2001, the number of checks at the maximum load point reported in the 4th Quarter FY2001 Service Standards Report were incorrect. Following are the correct values:

	FY2001		
	2nd Quarter	3rd Quarter	4th Quarter
Number of Checks at MLP	8,881	7,373	9,633

These reporting problems were considered minor and correctable.

Problems or Issues Identified During the Audit Period

No additional issues or problems were identified.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni adjusted the definition of measurement for pass-ups, as follows:

- **Pass-ups shall be conducted no less often than 10 weekdays per month.** At the beginning of each quarter, supervisory personnel will review all the lines checked in the previous quarter, and identify the five lines with the highest load factors, and the time period these load factors occurred. Supervisory personnel will then check those five lines, during the time period that the high load factor occurred, each month during the coming quarter for pass-ups. Supervisory personnel will check to see if any PSRs for pass-ups were made for any of those five lines, and if the location of the pass-up was recorded. If it was recorded, supervisory personnel will use that point as the point to check for pass-ups. If there are no locations recorded, supervisory personnel will use the stop just before the MLP.

Auditor Recommendations

Performance results have been reported in two different formats. The 4th Quarter FY2001 Service Standards Report contained a system-wide table summarized by quarter which included the following information: number of pass-ups, percentage of pass-ups, number of checks at MLP, and the lines with more than two pass-ups. The 4th Quarter FY2002 Service Standards Report did not contain a cumulative (each quarter and annual) systemwide table. Because the sampling plan for lines/modes varies by month, both a quarterly and an annual performance summary should be presented.

Two changes are recommended in reporting:

- Include a systemwide pass-up table by quarter with both number and %; show previous quarters and present an annual summary; and
- Track individual pass-up line performance over each quarter of each fiscal year.

The auditor also recommends that Service Standard 4a be coordinated with Service Standard 5a so that all lines identified as exceeding 85% of capacity during peak periods are monitored as part of Service Standard 4a. Additional data available through the Passenger Service Reports database should be utilized to conduct follow-up traffic checks on lines chronically identified as having pass-ups or peak period loads that exceed 85% of capacity.

5a. Peak period passenger load factors.

Goal:	No greater than 85% of combined seating & standing capacity
Purpose:	To measure load factors at peak periods
Definition of Measurement:	Monthly measurement of the 5 most patronized routes for each division. Such checks shall be conducted no less often than 10 weekdays per month on 5 different routes per month in each division, beginning with the most patronized route, progressing in the order of declining route patronage, and ending with the least patronized route. The cycle shall then be repeated.FY2002: Each line will be checked twice a year. Such checks shall be conducted no less often than 10 weekdays and weekends per check. An annual checking schedule shall be established for the routes. The order in which the routes are checked will be determined monthly through a random selection process. To the extent automated systems can be substituted at less cost for such checks, or the measurement of any performance standard, such systems must be used.
Method of Measurement:	Method of Measurement: " Periods of time includes morning rush (6 a.m. To 9 a.m.) midday (9 a.m.- 4 p.m.) evening rush (4 p.m. To 7 p.m.) and night (7 p.m. To 1 a.m.). Supervisory personnel shall conduct a one-hour, on time, and load standard check at a maximum load point at mid-route during all four time periods stated above."
Milestones:	FY2001 No Greater than 85% FY2002 No greater than 85%

From Muni Service Standards Report, FY2001 and FY2002

Reported Performance

Muni was unable to meet its goal of no lines over 85% capacity in either FY2001 or FY2002. Due to changes in the sampling methodology between those two years, annual performance results could not be accurately compared. This is discussed further in the section "Problems or Issues Identified." Although the goal was not met in FY2003, substantial improvement was made, with only 10 lines over 85% capacity. The following table shows the number of lines that failed to meet the standard of no greater than 85% of combined seating and standing capacity in fiscal years 2001, 2002, 2003 and the first quarter of FY2004.

Table A-7 Number of Lines that Exceeded 85% Capacity, FY2001 – FY2004

Month	FY2001	FY2002	*FY2003*	*FY2004*
July	8	3	*0*	*0*
August	4	5	*4*	*2*
September	5	2	*0*	*0*
October	2	4	*1*	
November	4	0	*0*	
December	1	0	*0*	
January	2	1	*1*	
February	3	0	*2*	
March	6	1	*0*	
April	6	4	*1*	
May	3	2	*1*	
June	4	2	*0*	
TOTAL	48	24	*10*	

From *Muni Service Standards Report,4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*
Data in italics have not been audited

Verification of Definition and Method of Measurement During the Audit Period

FY2001

The following changes in sampling methodology were approved by the MTA Board and subsequently implemented in FY2001:

- Light rail (LRV) and cable car divisions were combined into one rail sampling rotation with results reported separately; eight checks per month were reduced to five or four checks per month.
- Three motorcoach divisions were combined into one motorcoach sampling rotation; 15 checks per month were reduced to five checks per month.
- Two trolleycoach divisions were combined into one trolleycoach sampling rotation; 10 checks per month were reduced to five checks per month.

Lines were sampled within each mode according to ranked patronage as described in the definition of measurement. At least ten weekday checks were performed during each month for motor coach and trolley coach modes. Light rail and cable car modes were in compliance with the definition of measurement for the months they were sampled. All time periods were sampled in accordance with the definition and method of measurement.

FY2002

The selection of routes was coordinated with the Data Collection Plan (DCP), adopted by Muni for provision of data for internal planning purposes and to satisfy the annual NTD (and previously UMTA/FTA Section 15) ridership reporting. The FY2001 methodology for sampling 15 lines/checks per month was modified for FY2002 to include nine motorcoach lines, three to four trolleycoach lines, and two to three rail lines. A random selection process replaced the ranked ridership rotation process. Specific locations and time periods conformed to the DCP and included, as a minimum, the periods defined in Proposition E.

Verification of Reported Performance During the Audit Period

Based on an audit of data for FY2001 and FY2002, reported results match those submitted by Muni data staff.

Problems or Issues Identified During the Audit Period

Although the total number of lines checked was about the same for both FY2001 and FY2002, the number of lines checked within each mode changed between the two years. In FY2001, three to five lines were checked monthly in each of the three modes – rail, trolley and motor coach. In FY2002, monthly checks consisted of one to three rail lines, three to four trolley lines, and nine to ten motor coach lines. While this change led to a better balance of sampling between modes, it made it impossible to accurately compare performance between FY2001 and FY2002.

In FY2001, 48 out of the approximately 175 lines checked, or 27.4%, had load factors that exceeded 85%. In FY2002, 23 out of the approximately 176 lines checked, or 13.1%, had load factors that exceeded 85%. Analysis of the 24 lines that improved load factors between FY2001 and FY2002 showed that there was a reduction from 46 monthly samples above 85%, to only six monthly samples above 85%. For those same 24 lines, the rate of sampling was reduced by 30.1% between FY2001 and FY2002 from 83 samples to 58 samples.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, nor the milestones.

Auditor Recommendations

In all cases of non-compliant lines, sampling frequency should be increased from the previous year until a trend in compliance is noted. This will enable an accurate evaluation of improvement in line performance from year to year.

A more meaningful method of reporting may be to capture individual line load factors by 15-minute periods (quarter-hour peak periods), rather than for a full hour. This coincides with schedule evaluation and revision analysis processes, and would enable Muni staff to better pinpoint time periods that require greater capacity (in order to relieve overcrowding).

Performance results have been reported in two different formats. The 4th Quarter FY2001 Service Standards Report contained a system-wide table summarized by quarter which included the following information: number of pass-ups, percentage of pass-ups, number of checks at MLP, and the lines with more than two pass-ups. The 4th Quarter FY2002 Service Standards Report did not contain a cumulative (each quarter and annual) systemwide table. Because the sampling plan for lines/modes varies by month, both a quarterly and an annual performance summary should be presented.

The auditor also recommends that Service Standard 5a be coordinated with Service Standard 4a so that all lines identified as exceeding 85% of capacity during peak periods are monitored as part of Service Standard 4a. Additional data available through the Passenger Service Reports database should be utilized to conduct follow-up traffic checks on lines chronically identified as having pass-ups or peak period loads that exceed 85% of capacity.

6a. Actual headways against scheduled headways on all radial, express, cross-town, secondary, and feeder lines for peak, base, evening, and late night services.

Goal:	Operate no less than 80% of the time within 30% or 10 minutes of scheduled headway (whichever is less). FY2002: Operate no less than 85% of the time within 30% or 10 minutes of scheduled headway (whichever is less).
Purpose:	Measurement of scheduled headways against actual headways.
Definition of Measurement:	FY2001: Will measure average headway monthly and will designate type of line as part of Service Standard 1a – % of vehicles that run on time according to published schedules. Measurement of the 5 most patronized routes for each division. Such checks shall be conducted no less often than 10 weekdays and weekends per month on 5 different routes per month in each division, beginning with the most patronized route, progressing in the order of declining route patronage, and ending with the least patronized route. The cycle shall then be repeated. FY2002: Each line will be checked twice a year. Such checks shall be conducted no less often than 10 weekdays and weekends per check. An annual checking schedule shall be established for the routes. The order in which the routes are checked will be determined monthly through a random selection process. To the extent automated systems can be substituted at less cost for such checks, or the measurement of any performance standard, such systems must be used.
Method of Measurement:	Method of Measurement: Check the headways of designated lines. "Periods of time includes morning rush (6 a.m. to 9 a.m.) midday (9 a.m. - 4 p.m.) evening rush (4 p.m. to 7 p.m.) and night (7p.m. to 1 a.m.). Supervisory personnel shall conduct a one-hour, on-time, and load standard check at a maximum load point at mid-route during all four time periods stated above."
Milestones:	FY2001 FY2002 80% 85%

From *Muni Service Standards Report, FY2001 and FY2002*

Reported Performance

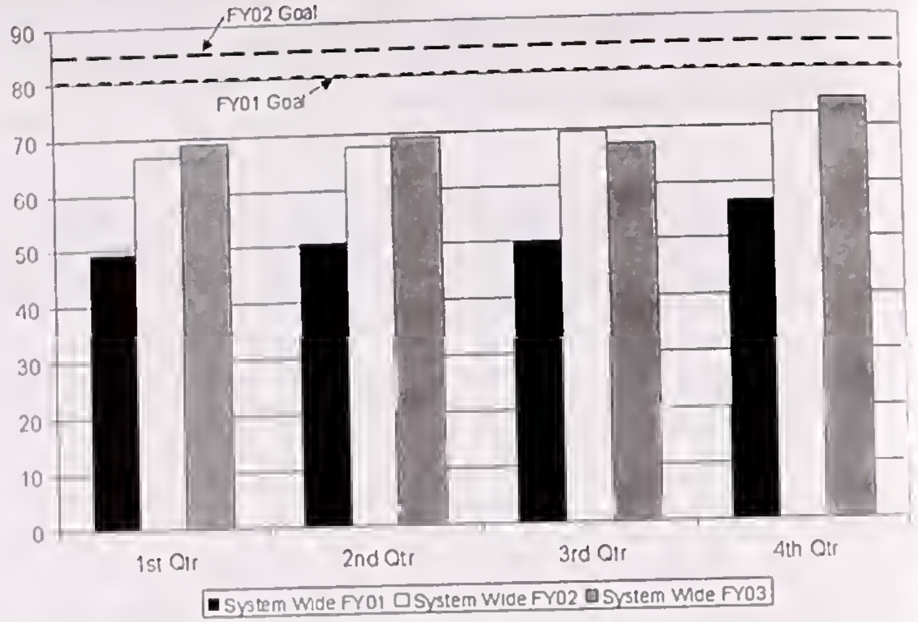
For the fourth quarter of FY2001, systemwide headway adherence was 56.8% (the percentage of sampled headways that were within 30% or 10 minutes of the scheduled headway, whichever was less). In the fourth quarter of FY2002, systemwide headway adherence rose to 72.1%, however results between FY2001 and FY2002 are not directly comparable due to a change in sampling methodology between FY2001 and FY2002. Headway adherence did not improve in FY2003 or the first quarter of FY2004. Table A-8 shows the average percentage of headway adherence for the lines measured within each month of fiscal years 2001, 2002, 2003 and the first quarter of FY2004.

Table A-8 Average Percentage of Lines Adhering to Scheduled Headways, FY2001 – FY2004

Month	FY2001	FY2002	FY2003	FY2004
July	45.0%	64.8%	73.3%	79.0%
August	44.4%	60.5%	65.8%	68.2%
September	60.6%	74.7%	65.8%	67.8%
October	45.8%	59.9%	77.7%	
November	54.0%	79.8%	70.2%	
December	50.2%	71.3%	59.4%	
January	54.5%	65.0%	62.7%	
February	43.7%	67.1%	69.7%	
March	50.5%	76.1%	66.7%	
April	64.3%	66.3%	81.1%	
May	53.4%	73.3%	67.6%	
June	57.4%	80.4%	75.9%	

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004
Data in italics have not been audited.

Figure A-1 Headway Adherence



From *Muni Service Standards Report, 4th Quarter FY2003.*

Verification of Definition and Method of Measurement During the Audit Period

FY2001

The following changes in sampling methodology were approved by the MTA Board and subsequently implemented in FY2001:

- Light rail (LRV) and cable car divisions were combined into one rail sampling rotation with results reported separately; eight checks per month were reduced to five or four checks per month.
- Three motorcoach divisions were combined into one motorcoach sampling rotation; 15 checks per month were reduced to five checks per month.

- Two trolleycoach divisions were combined into one trolleycoach sampling rotation; 10 checks per month were reduced to five checks per month.

Lines were sampled within each mode according to ranked patronage as described in the definition of measurement. At least ten weekday checks were performed during each month for motor coach and trolley coach modes. Light rail and cable car modes were in compliance with the definition of measurement for the months they were sampled. All time periods were sampled in accordance with the definition and method of measurement.

FY2002

The selection of routes was coordinated with the Data Collection Plan (DCP), adopted by Muni for provision of data for internal planning purposes and to satisfy the annual NTD (and previously UMTA/FTA Section 15) ridership reporting. The FY2001 methodology for sampling 15 lines/checks per month was modified for FY2002 to include nine motorcoach lines and three to four trolleycoach lines. A random selection process replaced the ranked ridership rotation process. Specific locations and time periods conformed to the DCP and included, as a minimum, the Proposition E defined time periods.

The two rail modes (light rail and cable car) as well as major radial lines were removed from the measurement for FY2002. The rationale for this decision was that the standard of 30% or better headway adherence was not applicable to smaller headways because it would not be meaningful. Overall, 60 lines were sampled in FY2002, compared with 82 lines in FY2001. (This change was approved by the MTA Board.) Measurement of headway adherence for all modes was resumed in FY2004.

Verification of Reported Performance During the Audit Period

Based on an audit of data for FY2001 and FY2002, reported results match those submitted by Muni data staff.

Problems or Issues Identified During the Audit Period

Muni has been unable to meet its headway adherence goals during all years of measurement. Adjustments to the method and definition of measurement had some impact on performance results, however changes that were made in FY2002 and FY2003 were reversed in FY2004. Consequently, it is necessary to further examine the reasons for failure to meet performance goals as well as the goals themselves, the definition of measurement, and the method of measurement.

Changes in Measurement Since the Audit Period

The following change was made to the Definition of Measurement in FY2004:

> *Each line will be checked twice a year. Such checks shall be conducted no less often than 10 weekdays and weekends per check. An annual checking schedule shall be established for the routes. The order in which the routes are checked will be determined monthly through a random selection process. To the extent automated systems can be substituted at less cost for such checks, or the measurement of any performance standard, such systems must be used. Actual headways against scheduled headways on all radial express, crosstown, secondary, and feeder lines for peak, base, evening, and late night services.* ***Will also check lines during periods when their headway is greater than 10 minutes.***

Action Plan

Streamlining the Service Standards and Improving the Definition of Measurement

Headway adherence is typically used to measure the reliability of transit services operating at headways that are 10 minutes or less.[4] From a passenger's perspective, only headway adherence matters when headways are 10 minutes or less, since passengers do not rely on schedules to plan their trips because they can rely on the fact that a vehicle will arrive shortly after they arrive at their stop.

Given that Muni has resumed measuring headway adherence on radial lines in FY2004, it is important to examine the most effective ways in which to measure headway adherence for high frequency transit services (those with headway intervals of 10 minutes or less). Headway adherence is a less relevant reliability measure for transit services with headways greater than 10 minutes, particularly if service reliability is already being measured by schedule adherence. Consequently, the auditor recommends that headway adherence be measured only for those transit services with headway intervals of 10 minutes or less, and that schedule adherence (i.e., on-time performance) be measured for all other transit services with headway intervals that are greater than 10 minutes. Furthermore, we recommend that the method of measuring headway adherence be modified so that it is more relevant to high frequency service. Following are three possible alternatives for changes to the method of measurement:

- **Alternative #1:** The method of headway adherence measurement recommended in the *Transit Capacity and Quality of Service Manual—2nd Edition* is based on the "coefficient of variation of headways" of transit vehicles and is calculated in the following way:

  Coefficient of variation of headways =
  (standard deviation of headway deviations)÷(mean scheduled headway)[5]

This calculation compares the difference between actual and scheduled headways with that of the scheduled headway. A lower coefficient means that there is very little deviation in actual headways from scheduled headways and that service reliability is excellent. A larger coefficient means that there is a significant amount of deviation between actual and scheduled headways and that service reliability is poor. The table on the opposite page summarizes information from the *Transit Capacity and Quality of Service Manual—2nd Edition* regarding coefficient values and associated levels of service (LOS). It is important to note that this measurement and its associated LOS values *only* applies to transit services with headways of 10 minutes or less.

If Muni chooses to use this measurement approach, a goal of LOS C or better should be established for headway adherence.

Level of Service	Coefficient Value	Comments
A	0.00-0.21	Service is provided like clockwork, with very regular headways.
B	0.22-0.30	Most vehicles are off the scheduled headway by a few minutes, but the likelihood of being off-headway by more than one-half the scheduled headway amount is low (e.g., 5 minutes off a 10 minute scheduled headway).
C	0.31-0.39	Vehicles are often off-headway, with a few headways much longer or shorter than scheduled.
D	0.40-0.52	Headways are quite irregular, with up to one in three vehicles one-half a headway or more off-headway.
E	0.53-0.74	Bunching occurs frequently.
F	0.75	Most vehicles are bunched.

From the *Transit Capacity and Quality of Service Manual—2nd Edition* (2003)

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[4] Ibid, p. 3-47.
[5] Ibid, p. 3-49.

- **Alternative #2:** The approach used by MTA-New York City Transit is similar to that currently used by Muni, but has a specified time window and focuses solely on incidences where headway times are exceeded. MTA-New York City Transit measures the percentage of transit vehicle arrivals where the actual headway exceeded the scheduled headway by more than 3 minutes. Actual headways that are less than scheduled headways are not considered, based on the assumption that short headways generally result from the previous vehicle's long headway, and that the vehicle with the long headway is the one that affects passenger service quality, as a result of longer wait times and more crowded conditions on board.[4]
- **Alternative #3:** This alternative should only be used if Muni continues to measure schedule adherence for all lines, regardless of their headway interval. While radial lines' frequency of scheduled service accommodates passenger demand, the reality of service delivery often presents gapping and bunching, resulting in abnormal headways. A surrogate measurement to capture the provision of capacity on major radial lines is the measurement of *throughput*. This observation and measurement of actual trips (the number of scheduled vehicles that pass a particular point within a given period of time) allows for a consistent report on trunk capacity and street conditions. Both Service Standards 1a (on-time performance) and 5a (peak period passenger load factors) measure components of major radial service delivery, but neither captures loss of capacity. MTA could consider substituting throughput for Service Standard 6a. The Proposition E target of 80% should be modified over a multi-year program to reach 90%. The correlation of this target to that of Service Standard 2a ("not less than 98.5 % on July 1, 2004") is important, so that there is an allowance for on-street loss of specific trips/throughput due to equipment malfunctions, blockages, etc.

Additional Recommendations to Improve Performance

As was the case with on-time performance in Service Standard 1a, it is likely that on-street attention to supervision and preparation of new schedules will be needed in order to achieve headway adherence goals. For further detail, please see the recommendations made with regard to "Schedule Evaluation/Remediation" and "Route Evaluation" under the Action Plan for Service Standard 1a.

Sampling Resources – Reallocation of Terminal Checking to Increased NTD Checking

Although the Proposition E measurement requirement included checks at terminals and established timepoints, the checking resources expended to collect from terminals is about twice that required for established/intermediate timepoints. The Proposition E mid-point sampling plans are coordinated with Muni's NTD sampling plans to minimize the checking resources expended. The Data Collection Plan for FY2003 (August 1, 2002) indicates that 9,720 hours per year of checking is required for the Proposition E program at 4.5 locations per line. Additionally, 3,432 hours per year of checking is required for the NTD program at two locations per line. Clearly, a significant 74% of the combined programs is allocated to Proposition E.

The resulting difference in schedule adherence (between terminals and intermediate timepoints) is only about 1%, however. Thus, while checking terminals provides a validation of the checks at intermediate timepoints and identifies trips that leave the terminal off-schedule, actual results indicate that such a validation may not be necessary. It would appear prudent to increase the sampling of intermediate timepoint checks in lieu of the terminal checks with the goal of sampling each line each quarter rather than the current twice yearly target.

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[4] Ibid., p 3-49

The auditor recommends that the portion of Proposition E checking hours allocated to terminal checks (roughly 4,320 hours per year) be reallocated to mid-point locations. The goal of such a reallocation would be to increase the frequency of checks to provide additional seasonal/quarterly observations on each mode. Poorly performing routes should be targeted for additional observations as well. If the approximately 4,320 hours currently allocated to terminal checks were reallocated to the current NTD program of 3,432 hours, it would more than double the frequency of checks made under the NTD program.

Another opportunity for reallocating on-time performance checking resources could be found by taking advantage of existing technology. On-time performance of routes that are monitored by Next Bus and/or by the ATCS system in the subway could be done with improved accuracy by taking advantage of those automated systems. Checker hours deployed on those routes could be used for additional monitoring of targeted services.

Coordination with other Goals and Objectives

On-time performance is closely related to the other performance goals within this group of service standards. The steps taken to improve on-time performance should be closely coordinated with actions taken to achieve other performance measures, particularly those related to schedule adherence (1a), delivery of scheduled service (2a) and safety (6d).

Use of Cumulative, Annual Performance vs. Quarterly Performance

Rather than using fourth-quarter results to determine achievement of annual goals, the auditor recommends that cumulative or average annual performance be used instead. There are a number of internal and external factors that lead to substantial variation in performance between quarters, including the fact that different lines are sampled each year during the fourth quarter. Reporting year-to-date or cumulative annual performance may provide a better picture of systemwide and modal performance over the entire year. Quarterly performance could still be used to determine variations in progress toward meeting performance goals throughout the year. Following are both the fourth quarter and year-to-date systemwide performance in FY2001 and FY2002.

	FY2001		FY2002	
	4th Quarter	Year-to-Date	4th Quarter	Year-to-Date
Systemwide	56.8%	51.8%	72.1%	69.0%

Performance results for this service standard have been reported in two different formats. The 4th Quarter FY2001 Service Standards Report contained a system-wide table summarized by quarter which included information on headway adherence for each mode and for the entire system for each quarter. The 4th Quarter FY2002 Service Standards Report did not contain a systemwide and modal summary table. Because the sampling plan for lines/modes varies by month, both a quarterly and an annual performance summary should be presented.

7a. % vehicle availability and reliability (mean distance between failure) by mode.

Goal:	No less than 98.5% Vehicle Availability
Purpose:	To measure the percentage of equipment available for service.
Definition of Measurement:	Monthly measurement of availability as a percentage of vehicles at each facility available at 7 a.m. and 4 p.m. on non-holiday weekdays against peak demand requirement. An additional measurement is added which shows the number of days when a facility (mode) does not have 100% availability.
Method of Measurement:	The Vehicle Maintenance System provides the data for all modes with the exception of Cable Car. A vehicle is considered available for service if it is available for assignment to an operator no later than 7:00 a.m. and 4:00 p.m.
Milestones:	98.5% (for both FY2001 and FY 2002)

From *Muni Service Standards Report, FY2001 and FY2002*

Reported Performance

For both FY2001 and FY2002, all modes, with the exception of light rail, met the goal of 98.5% vehicle availability for both AM and PM periods. (For light rail, percent vehicle availability was 97.5% for AM and 97.4% for PM for the fourth quarter of FY2002.) The following tables summarize the reported performance for FY2001 – FY2004. Vehicle reliability (mean distance between failure) by mode is not reported as part of this service standard, but is instead reported under standard 9a, "Miles between roadcalls by mode."

Although cumulative performance over the entire fiscal year was reported for FY2001, only quarterly performance was reported for FY2002. Average annual performance was used to determine if the FY2001 goal was met, while fourth quarter performance was used to determine whether or not the FY2002 goal had been met. (The MTA Board established that performance for the entire fiscal year would be measured by fourth quarter performance, rather than by performance over the entire year.) To compare performance for the two years, and subsequent years, only fourth quarter performance is presented here. Light rail appears to be consistent in its inability to meet the established goal during the fourth quarter of each fiscal year for which data are available. Other modes and divisions have met the goal relatively consistently.

It should be noted that in many cases a surplus of vehicles (more than 100%) are available for service. However, for the purposes of the Service Standards Report, surplus availability was simply reported as 100%.

The definition of measurement states, "An additional measurement is added which shows the number of days when a facility (mode) does not have 100% availability." This measurement was not included in either the FY2001 or FY2002 Service Standards Reports.

Table A-9 FY2001 AM/PM Vehicle Availability

AM & PM Vehicle Availability	1st Q AM	1st Q PM	2nd Q AM	2nd Q PM	3rd Q AM	3rd Q PM	4th Q AM	4th Q PM	FY01 GOAL
Motor Coach	99.2%	99.9%	94.8%	96.9%	98.4%	99.1%	99.7%	99.4%	98.5%
Flynn-Artic	99.8%	99.8%	94%	94.3%	96.3%	95.7%	99.7%	99.2%	
Kirkland	97.9%	100%	90.4%	96.4%	96.6%	100%	98.9%	98.4%	
Woods	100%	100%	100%	100%	100%	100%	100%	100%	
Trolley Coach	99.8%	99.4%	99.7%	97.9%	99.9%	99.5%	99.8%	98.8%	
Potrero-Artic	99.5%	98.3%	99.7%	94%	99.3%	97.4%	98.9%	95.0%	
Potrero	100%	100%	100%	99.9%	100%	99.9%	99.9%	97.2%	
Presidio	100%	100%	99.4%	99.7%	100%	100%	100%	100%	
Light Rail	98.6%	98.4%	96.8%	96%	96.2%	92.5%	99.9%	99.5%	
Breda*	98.8%	99.4%	98.2%	99%	--	--	--	--	
Boeing*	94.8%	92.8%	90.7%	85.9%	--	--	--	--	
F Line	98.7%	99.2%	98.4%	99.1%	100%	100%	100%	100%	
Cable Car	100%	100%	100%	100%	100%	100%	100%	100%	

From *Muni Service Standards Report, 4th Quarter FY2001.*

*Note: Results for Breda and Boeing divisions were not reported separately after the second quarter.

Table A-10 FY2002 AM/PM Vehicle Availability

AM & PM Vehicle Availability	1st Q AM	1st Q PM	2nd Q AM	2nd Q PM	3rd Q AM	3rd Q PM	4th Q AM	4th Q PM	FY02 GOAL
Motor Coach	98.3%	99.1%	98.3%	97.7%	98.1%	99.9%	99.9%	99.8%	98.5
Flynn-Artic	97.6%	97.2%	100%	100%	99.9%	100%	100%	100%	
Kirkland	95.3%	98.7%	93.2%	91.2%	92.6%	97.4%	99.7%	99.5%	
Woods	100%	100%	100%	100%	100%	100%	100%	100%	
Trolley Coach	99.9%	98.8%	99.0%	97.7%	98.5%	98.9%	99.2%	98.6%	
Potrero-Artic	99.3%	98.5%	98.8%	96.7%	98.7%	98.6%	100%	100%	
Potrero	99.9%	96.8%	99.6%	96.8%	99.0%	97.7%	100%	99.7%	
Presidio	100%	100%	98.2%	98.5%	98.2%	99.6%	96.9%	97.3%	
Light Rail	100%	99.2%	99.3%	99.0%	97.3%	97.1%	97.5%	97.4%	
F-Line	100%	100%	100%	100%	100%	100%	100%	100%	
Cable Car	100%	100%	100%	100%	100%	100%	100%	100%	

From *Muni Service Standards Report, 4th Quarter FY2002.*

Table A-11 FY2003 AM/PM Vehicle Availability

AM & PM Vehicle Availability	1st QAM	1st QPM	2nd QAM	2nd QPM	3rd QAM	3rd QPM	4th QAM	4th QPM	FY03 GOAL
Motor Coach	**99.2%**	**99.4%**	**99.5%**	**99.8%**	**99.9%**	**99.9%**	**99.7%**	**99.6%**	98.5%
Flynn-Artic	99.9%	99.8%	100%	99.9%	99.9%	99.9%	98.9%	98.2%	
Kirkland	97.8%	99.5%	100%	100%	100%	99.9%	99.9%	98.2%	
Woods	100%	99.1%	99.9%	99.7%	100%	100%	100%	100%	
Trolley Coach	**99.9%**	**99.1%**	**100%**	**100%**	**99.9%**	**99.8%**	**99.9%**	**99.8%**	
Potrero-Artic	99.5%	99.3%	100%	100%	100%	100%	99.4%	98.4%	
Potrero	100%	97.7%	100%	100%	100%	100%	100%	100%	
Presidio	100%	99.9%	100%	100%	99.9%	99.6%	100%	100%	
Light Rail	**96.8%**	**96.5%**	**99.3%**	**98.9%**	**99.2%**	**98.5%**	**98.6%**	**97.8%**	
F-Line	**100%**	**100%**	**98.1%**	**99.3%**	**99.8%**	**99.7%**	**100%**	**100%**	
Cable Car	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	

From *Muni Service Standards Report, 4th Quarter FY 2003*
Data in italics have not been audited.

Table A-12 FY2004 1st Quarter AM/PM Vehicle Availability

AM & PM Vehicle Availability	1st QAM	1st QPM	FY04GOAL
Motor Coach	**99.8%**	**99.3%**	98.5%
Flynn-Artic	99.4%	97.2%	
Kirkland	100%	100%	
Woods	100%	100%	
Trolley Coach	**99.9%**	**99.9%**	
Potrero-Artic	99.4%	99.3%	
Potrero	100%	100%	
Presidio	100%	100%	
Light Rail	**92.3%**	**92.3%**	
F-Line	**98.8%**	**99.8%**	
Cable Car	**100%**	**100%**	

From *Muni Service Standards Report, 1st Quarter FY2004*
Data in italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

For both FY2001 and FY2002, data were collected and aggregated according to the definition and method of measurement included in the Service Standards Reports. Vehicles are unavailable during repairs or maintenance and are considered to be "on hold" if they are unavailable for service for longer than a one-hour period of time. When repairs or maintenance are completed, the vehicle is taken off hold. All vehicle maintenance data are entered into the Vehicle Maintenance System (VMS). Operations personnel are instructed to save the hold count in VMS each morning and afternoon. VMS automatically calculates the daily percentage availability using this information.

Daily percentage availability data was then downloaded from VMS and entered into spreadsheet software in order to calculate monthly and quarterly availability for each division and mode. To calculate the overall total vehicle availability for the motor coach and trolley modes, a weighted average based on the number of vehicles that were within each motor coach and trolley division was used.

Verification of Reported Performance During the Audit Period

Based on an audit of the monthly and quarterly VMS reports for the AM percent vehicle availability data for FY2002, data appear to be reported correctly.

Problems or Issues Identified During the Audit Period

No issues or problems were found with the method of measurement, however several problems with both reported performance and the definition of measurement were found. Reported performance was not consistent between quarterly Service Standards Reports in FY2001. For FY2001, first quarter performance reported in the 1st Quarter FY2001 Service Standards Report did not match first quarter performance reported in the 2nd Quarter FY2001 Service Standards Report. Similarly, third quarter performance reported in the 3rd Quarter FY2001 Service Standards Report did not match reported third quarter performance in the 4th Quarter FY2001 Service Standards Report. For FY2002, performance was reported consistently between quarters.

For both FY2001 and FY2002, the definition of measurement was not followed completely. Part of the definition of measurement states, "An additional measurement is added which shows the number of days when a facility (mode) does not have 100% availability." This information was not reported in either the FY2001 or the FY2002 quarterly Service Standards Reports. While this statement was removed from the FY2003 Service Standards Reports, it was included but not reported in the FY2004 First Quarter report.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, nor the milestones.

Auditor Recommendations

Rather than using fourth quarter results to determine achievement of annual goals, the auditor recommends that cumulative or average annual performance be used instead. There are a number of internal and external factors that lead to variation in performance between quarters. Reporting year-to-date or cumulative annual performance may provide a better picture of systemwide and modal performance over the entire year. Quarterly performance could still be used to determine variations in progress toward meeting performance goals throughout the year.

It is difficult to ascertain from this measure whether failures to meet 98.5% or 100% vehicle availability are due to an insufficient number of spare vehicles, or an overwhelming number of mechanical failures, or a combination of both. Reporting information on spare ratios (the number of spare vehicles divided by the fleet size) for each mode and division could provide useful information about the efficiency of fleet utilization and the underlying causes of failures to meet goals for percent vehicle availability.

Finally, the definition of measurement should be amended to remove the statement, "An additional measurement is added which shows the number of days when a facility (mode) does not have 100% availability," or this information should be included in the Service Standard Reports.

8a. Unscheduled absences by operator, mechanical and administrative personnel.

<table>
<tr><td>Goal:</td><td>Annual 5% reduction of YTD for Maintenance (Mechanical), 10% reduction for Transportation (Operators), and 5% reduction for Administration.</td></tr>
<tr><td>Purpose:</td><td>To measure unscheduled absences.</td></tr>
<tr><td>Definition of Measurement:</td><td>Monthly measurement of unscheduled absences is a defined as time that is not scheduled in advance and includes the following payroll categories:
Method of Measurement: Sick pay (with pay), Sick Leave (without pay), AWOL, Worker's Comp, SDI [long-term illness], and Assault Pay. The online Attendance Tracking System currently provides the data as a calculation of scheduled hours available against unscheduled hours. Unscheduled absences is tracked for operators, mechanical and administrative staff by mode.</td></tr>
<tr><td>Method of Measurement:</td><td></td></tr>
<tr><td>Milestones:</td><td>
<table>
<tr><th colspan="2">FY2001</th><th colspan="2">FY2002</th></tr>
<tr><th>Division</th><th>Goal</th><th>Division</th><th>Goal</th></tr>
<tr><td>Maintenance</td><td>5% Reduction of FYTD</td><td>Maintenance</td><td>5% Reduction of FYTD</td></tr>
<tr><td>Operations</td><td>10% Reduction of FYTD</td><td>Administration</td><td>5% Reduction of FYTD</td></tr>
<tr><td>Administration</td><td>5% Reduction of FYTD</td><td>Operations</td><td>5% Reduction of FYTD</td></tr>
<tr><td></td><td></td><td>Transit Operators</td><td>10% Reduction of FYTD</td></tr>
</table>
</td></tr>
</table>

From Muni Service Standards Report, FY2001 and FY2002

Reported Performance

Unscheduled absence hours were reported as a percentage of the total scheduled hours for each division. For FY2001, operations absences included both transit operators as well as other operations support staff. In FY2002, these two divisions were reported separately, and different milestones were established for each.

As shown in the following table, all three divisions failed to meet their percentage goals for FY2001. While the Administration Division failed to meet its established goal again in FY2002, all other divisions either met or did better than their established goals in FY2002. All divisions were able to meet their goals in FY2003. Table A-13 summarizes the percentage of unscheduled absences for FY2001 – FY2003.

Table A-13 Percentage of Unscheduled Absences, FY2001-FY2003

	FY2001		FY2002		FY2003		FY2004
Division	Goal	Actual	Goal	Actual	Goal	Actual	Goal
Maintenance	7.0%	8.1%	7.7%	7.6%	7.2%	*6.2%*	5.9%
Administration	5%	6.8%	5.3%	0.0%	5.7%	*5.0%*	4.8%
Transportation*	12.7%	13.7%	--	--			
Operations	--	--	8.1%	8.1%	7.7%	*7.2%*	6.8%
Transit Operators	--	--	13.1%	12.8%	11.5%	*11.1%*	10.0%

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*

Data in italics have not been audited.

*Note: Transportation included both Operations and Transit Operators in FY2001

Verification of Definition and Method of Measurement During the Audit Period

Scheduled and unscheduled hours are tracked in two automated timekeeping systems – ATS and TESS. TESS is a relatively new timekeeping system, and hours for maintenance, administrative and operations personnel is tracked in this system. However, some hours for maintenance and operations are still tracked in ATS, and all transit operator hours are tracked in ATS.

Verification of Reported Performance During the Audit Period

Based on an audit of data for the third quarter of FY2002, all data appear to be reported correctly.

Problems or Issues Identified During the Audit Period

There were no problems or issues with regard to reported performance, or the definition or method of measurement. Tabulating unscheduled and scheduled hours data from two different timekeeping systems is time-consuming, however, and would be simplified if all timekeeping was done within one database.

Changes in Measurement Since the Audit Period

The Method of Measurement was changed in FY2003 to:

> *The online Attendance Tracking System provides the data as a calculation of scheduled hours available against unscheduled hours for Transit Operators. The TESS Timekeeping System provides the unscheduled absences for Maintenance, Administrative and Operations employees. Unscheduled absences are tracked for operators, mechanical and administrative staff by mode.*

Auditor Recommendations

In terms of service reliability, only a significant number of unscheduled absences of Maintenance and Operations staff will negatively impact service provision. Additionally, the percentage of unscheduled absences for the Administration Division is the lowest for all divisions measured. Consequently, the goal for reduction of unscheduled absences for the Administration Division should be relaxed, and a more reasonable target should be established.

9a. Miles between roadcalls by mode.

Goal:	Increase the miles between roadcalls.
Purpose:	Measure reliability through the miles a vehicle travels between failures.
Definition of Measurement:	Monthly measurement is currently dictated by the Federal Transit Administration as follows: "Failures are classified as either a major or minor failure of an element of the vehicle's mechanical system. For each incident of a major or minor failure, report whether the vehicle completes the trip or the vehicle does not complete the trip. If the failure occurs during deadhead or layover, include this in revenue vehicle system failures."
Method of Measurement:	Data is collected and input into the online Vehicle Maintenance System for all revenue vehicles except for Cable Car, which has its own internal tracking system. Reports are generated and the data for roadcalls is analyzed against the Central Control log. All verifiable major and minor mechanical defects are included as part of the Mean Distance between defects number. Areas that do not result in a chargeable roadcall to the maintenance shops include accidents, sick passengers, vandalism, body damage and broken windows.
Milestones:	Milestones: Increase miles between failures (see table).

From *Muni Service Standards Report, FY2001 and FY2002*

Reported Performance

Although cumulative performance over the entire fiscal year was reported for FY2001, only quarterly performance was reported for FY2002, and fourth quarter performance was used to determine whether the FY2002 goal had been met. (The MTA Board established that performance for the entire fiscal year would be measured by fourth quarter performance, rather than cumulatively.)

In FY2001, the Kirkland motor coach, Standard Potrero, Presidio, Boeing Light Rail, Breda Light Rail and Cable Car divisions all met their fiscal year goals at the end of the fourth quarter. In FY2002, the Flynn-Articulated, Presidio, Boeing Light Rail, Breda Light Rail, and Cable Car divisions all met their fiscal year goals at the end of the fourth quarter. In FY2003, most divisions were able to meet their goals during the fourth quarter, however fewer were able to meet their goals with regard to cumulative annual performance. Table A-14 summarizes this information.

Table A-14 Miles between Roadcalls (Mean Distance between Failures), FY2001 – FY2004

	FY2001			FY2002		FY2003			FY2004	
Mode and Division	**4th Quarter**	**FYTD**	**Goal**	**4th Quarter**	**Goal**	**4th Quarter**	**FYTD**	**Goal**	**1st Quarter**	**Goal**
Motor-Coach – Mean Distance Between Failures (Miles)										
Flynn-Artic	837	873	1,500	1,929	*1,500*	*3,033*	*2,299*	*1,750*	*2,279*	*2,000*
Woods	1,773	1,902	3,000	1,760	*3,000*	*2,802*	*2,176*	*2,500*	*3,014*	*2,750*
Kirkland	3,467	3,138	3,000	2,381	*3,000*	*3,992*	*2,918*	*3,000*	*4,455*	*3,000*
Trolley Coach – Mean Distance Between Failures (Miles)										
Artic Potrero	443	509	500	508	*750*	*583*	*541*	*650*	*630*	*675*
Standard Potrero	691	737	550	795	*800*	*861*	*762*	*1,000*	*860*	*1,000*
Presidio	1,375	1,002	550	1,223	*800*	*1,221*	*1,279*	*1,000*	*1,280*	*1,250*
Rail – Mean Distance Between Failures (Miles)										
Boeing Light Rail	1,706	1,447	1,300	Fleet Retired						
Breda Light Rail	3,271	2,246	1,800	3,276	*1,900*	*3,128*	*3,328*	*3,000*	*3,428*	*3,500*
PCC	808	905	1,250	1,496	*1,250*	*1,148*	*1,309*	*1,250*	*1,034*	*1,250*
Cable Car – Mean Distance Between Failures (Miles)										
	5,620	4,809	2,530	5,631	*3,000*	*6,387*	*5,658*	*5,000*	*6,611*	*5,500*

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*
Data in Italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

Mean distance between failures (MDBF), or miles between roadcalls, data were collected and tabulated according to the established definition and method of measurement, however roadcall data were tabulated directly from the Central Control log and mileage data were tabulated from the Vehicle Maintenance System (VMS) for all modes except cable car. Following is a more detailed description of data collection and aggregation procedures used for each division. All divisions used the number of FTA-reportable roadcalls (major or minor mechanical failures) to determine MDBF.

Quarterly MDBF represents the average MDBF data for each month within the quarter, except for LRV. Most LRV quarterly calculations were made by dividing the total mileage for the quarter by the total number of roadcalls, rather than averaging the MDBF for each month within the quarter.

Motor Coach

Prior to October 2001, roadcalls were logged directly with the Motorcoach division. During this time, the number of reported roadcalls entered into VMS was not checked against the Central Control log, and it was likely that the number of roadcalls entered into VMS was slightly less than the actual number of roadcalls as a result. After October 2001, roadcall data were downloaded from the Central Control log on a daily basis. The Central Control log was compared to the repair log to determine the actual number of failures. (Occasionally, reported failures were determined to be inaccurate after maintenance staff found no mechanical defects.) Spreadsheet software was used to tabulate the number of roadcalls and MDBF for each quarter during FY2001 and FY2002.

Vehicle mileage was also tracked using VMS. All vehicles used hub odometers, and mileage counts were electronically uploaded directly into VMS. Mileage data was double checked against fuel usage data to determine any inaccuracies or mistakes.

Potrero Trolley

Roadcall data were downloaded from the Central Control log and tabulated either by hand or using spreadsheet software. Mileage data obtained from either dash or hub odometers were entered into VMS and double checked by maintenance staff. Spreadsheet software was used to calculate MDBF using roadcall data from the Central Control log and mileage data from VMS.

Presidio Trolley

Prior to March 2001, roadcall data was obtained daily from the Central Control log and was totaled for each month and quarter. After March 2001, the division used its own daily roadcall log to determine the number of roadcalls or failures.

Maintenance staff recorded mileage daily on a handwritten log and then entered it into VMS. A supervisor double-checked all mileage entries. MDBF was calculated monthly by hand using totals from printouts of the Central Control log (for roadcalls) and VMS (for mileage).

Light Rail Vehicles

Roadcalls were recorded by maintenance personnel. Only roadcalls that required more than five minutes to address (from arrival to resolution) and were FTA-reportable were counted toward the MDBF calculation. In FY2001 and FY2002, LRV roadcalls did not go through Central Control, but were tracked by the division. The PCC maintenance crew also tracked their roadcalls. Roadcall data from PCC and LRV maintenance was cross-checked for any duplications, and then tabulated.

For light rail vehicles other than historic PCC cars, mileage was tracked daily and then entered into VMS. For historic PCC cars (which do not have odometers), staff calculated mileage by multiplying the number of service hours by 9.5 miles per hour (which is assumed to be the average travel speed for these vehicles). Staff used spreadsheet software to calculate MDBF from reported roadcall and mileage data.

Cable Car

Because cable cars do not have odometers, staff calculated the actual fleet mileage by subtracting the number of miles lost due to missed trips and chargeable roadcalls from the scheduled mileage (scheduled trips per day multiplied by the miles per trip) for each day.

Roadcalls from the roadcall log were recorded into the daily morning report. Daily reports were used to calculate the number of roadcalls per month. MDBF calculations for each month were made by hand using the calculated mileage and roadcall data.

Verification of Reported Performance During the Audit Period

Motor Coach

Based on an audit of FY2001 data, only the reported performance data from the third quarter matched the original data provided by the division. For the first, second and fourth quarters of FY2001, source data did not match what was reported in the 4th Quarter FY2001 Service Standards Report. The following discrepancies were found:

Mean Distance Between Failures (Miles) Reported and Audited Data

[redacted]

Division	Reported	Audited	Reported	Audited	Reported	Audited
Flynn-Artic	931	870	916	920	837	942
Woods	1,840	1,847	2,041	2,074	1,773	1,826
Kirkland	3,119	2,925	3,090	3,113	3,467	3,438

Potrero Trolley

Based on an audit of data for the first and fourth quarters of FY2002 for both the Standard and Artic Divisions, data appear to be reported correctly.

Presidio Trolley

Based on an audit of data for the first quarter of FY2001, data appear to be reported correctly.

Light Rail Vehicles

For FY2001, quarterly MDBF data for each of the four quarters were calculated by dividing the total mileage for the quarter by the total number of roadcalls that occurred within the quarter. For FY2002, this same calculation method was used to determine the MDBF for the first and fourth quarters, however the MDBF for the second and third quarters was calculated by averaging the MDBF for the months within each quarter.

The FY2002 third quarter MDBF reported for the entire Light Rail Division does not match source data. According to the 3rd Quarter FY2002 Service Standards Report, the FY2002 third quarter MDBF for the Light Rail Division was 2,237. According to source data, the average MDBF for the Light Rail Division should be 2,657 for the third quarter of FY2002.

Cable Car

Based on an audit of data for the fourth quarter of FY2002, data appear to be reported correctly.

Problems or Issues Identified During the Audit Period

Quarterly MDBF data were not calculated in a consistent manner for light rail vehicles. In FY2002, first and fourth quarter data were calculated by dividing the total mileage for the quarter by the total number of roadcalls that occurred within the quarter. The MDBF for the second and third quarters was calculated by averaging the MDBF for the months within each quarter. In addition, numerous calculation errors were identified. It is possible that audited source data was adjusted in some way prior to reporting; however, no documentation of those adjustments were identified.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, nor the milestones.

Auditor Recommendations

Quarterly MDBF should be calculated in a consistent manner – either by dividing the total mileage by the total number of roadcalls, or by averaging the MDBF for the three months within a quarter. A description of the calculation method should be added to the section describing the method of measurement.

Rather than using fourth quarter results to determine achievement of annual goals, the auditor recommends that cumulative or average annual performance be used instead. There are a number of internal and external factors that lead to variation in performance between quarters. Reporting year-to-date or cumulative annual performance provides a better picture of systemwide and modal performance over the entire year. Quarterly performance could still be used to determine variations in progress toward meeting performance goals throughout the year.

B. *System Performance*

Transit system performance measures assess how well transit agency resources are being utilized, how efficiently service is provided within constraints, how effectively transportation demand is met, and how well the agency is administered.[1] Proposition E included the following service standards to measure Muni's system performance:

- 1b. Passengers carried by mode.
- 2b. Fare Revenue generated by mode.
- 3b. Hours and miles operated by mode.
- 4b. Expenses incurred by mode.

Key Recommendations

The following are key recommendations based on the findings of our audit of FY2001 and FY2002 Service Standards data and on trends observed in unaudited FY2003 and FY2004 Service Standards data:

- For Service Standard 1b, realistic goals for ridership should be established based on economic conditions as well as available service.
- Fare revenue is an important management tool that can serve as a surrogate for ridership during periods of fare stability. Combined with other indicators, it is possible to calculate average fare per passenger, a useful management tool when looking at alternative fare structures. Wile this indicator should be continued, the current practice of changing the benchmark for fare revenue annually based on the prior year's actual experience does not allow for reasonable comparison across time. Rather than continuing to alter the benchmark, it is recommended that the milestone be restated: "Fare revenue should increase by 1.5% per year compared with prior year performance." Changing the milestone in this way will allow for comparisons over time, and will serve as a better indicator of the need to adjust fares and fare structure.
- Miles and hours of service are a direct reflection on the available budget. It is not reasonable to expect that in times of budget constraints miles and hours of service will continue to increase, or even remain constant. Miles and hours of service are important inputs to the National Transit Database (NTD) reporting, and will be calculated annually whether or not they continue to be used as a performance measure. However, it is recommended that this NOT be continued as a service standard at this time.
- The goal and information presented for Service Standard 4b has limited value to the public or to Muni itself. In fact, Muni has no opportunity to exceed its budget without receiving a supplemental appropriation, as a City agency cannot operate in deficit. Rather than comparing expenses to budget by mode, which is an artificial comparison, it is recommended that Muni track fully allocated costs per hour of service by mode. This standard industry benchmark would allow Muni to compare its unit costs against other similar properties nationwide. This information is calculated by the Finance Department regularly for the NTD report, and would not require additional effort.

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[1] "A Guidebook for Developing a Transit Performance-Measurement System," *TCRP Report 88*, 2003, p.126. www.tcrponline.org

1b. *Passengers carried by mode.*

Goal:	To increase the number of passenger boardings by mode by 2%.
Purpose:	Measurement of the ridership.
Definition of Measurement:	Annual measurement of the number of passengers who board the Muni's revenue vehicles. A passenger is counted each time they board a vehicle, even though they may be on the same journey from origin to destination. Data will be reported to the board on a quarterly basis.
Method of Measurement:	Ride checkers are utilized to count the passenger boardings.
Milestones:	2% increase over previous year

From *Muni Service Standards Report, FY 2001 and FY2002*

Reported Performance

Ridership data are reported annually, with data from the previous year reported for the current fiscal year (i.e., for the FY2002 Service Standards Report, ridership for FY2001 was reported). This is due to the fact that final ridership calculations cannot be completed until several months after the conclusion of the fiscal year.

For both FY2000 and FY2001, systemwide ridership increases exceeded the goal of 2% growth from the previous year. However, this growth was not distributed evenly among all modes. The most significant ridership gains were for light rail vehicles, while cable cars lost ridership during both years. Motor coach ridership also fell between FY2000 and FY2001. Between FY1999 and FY2001, ridership on all modes, except for cable car, increased by more than 2%. Ridership decreased by 7% between FY2001 and FY2002, and decreased by 1.3% between FY2002 and FY2003. (This decrease is most likely due to the overall economic downturn that occurred during this period of time.) Table B-1 summarizes ridership and percent change in ridership for fiscal years 1999, 2000, 2001, 2002 and 2003.

Table B-1 Muni Ridership, FY1999 – FY2003

Division	FY1999	FY2000	Percent Change (FY99-FY00)	FY2001	Percent Change (FY00-FY01)	Percent Change (FY99 FY01)	FY 2002	FY 2003	Percent Change (FY01-02)	Percent Change (FY02-03)
Motor Coach	92,978,418	96,394,514	3.7%	96,032,546	0.4%	3.3%	*92,269,201*	*90,880,679*	-3.9%	-1.5%
Trolley Coach	78,275,162	78,460,995	0.2%	80,868,518	3.1%	3.3%	*73,968,384*	*74,398,945*	-8.5%	0.6%
Light Rail Vehicle	35,659,856	41,610,040	16.7%	49,698,816	19.4%	30.4%	*44,976,474*	*42,896,269*	-0.5%	-4.6%
Cable Car	9,701,321	9,206,298	-5.1%	8,312,945	-9.7%	14.3%	*7,257,083*	*7,418,790*	-12.7%	2.2%
TOTAL	216,614,757	225,671,847	4.2%	234,912,825	4.1%	8.4%	*218,461,742*	*215,594,683*	-7.0%	-1.3%

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*

Data in italics have not been audited

Verification of Definition and Method of Measurement During the Audit Period

Annual ridership was estimated using Muni's standard ride check protocols. Baseline ride checks are scheduled to occur every four years. Baseline ride checks were actually conducted about every five years due to staff turnover. (In other words, the baseline ridership for a particular line would be reestablished with empirical data only every five years.) Lines that had not been checked within the last four years were given priority to be re-checked, as were lines that underwent some other type of significant change (either a route change, or significant change in land use along the route). Nearly all lines have had baseline checks since 1998.

Ride checkers carry a handheld electronic device which they use to count boardings and alightings. Typically, one checker is assigned to a vehicle. Counts are electronically uploaded from the handheld devices onto computers. Specialized software is then used to calculate loads and check that boardings and alightings balance out. Checkers also count the number of trips that occur within a given time period. This information is entered into the computer software as well. The daily boardings during a given time period are calculated by multiplying the average boardings per trip and the actual number of trips that occurred within a given time period.

Raw data are edited before baselines are calculated. The RUCUS software program (developed specifically for Muni) is used to run the baseline calculations. Baseline data are used to develop a conversion factor allowing ridership at the maximum load point on a line to be converted to a ridership estimate for an entire line. This methodology has been approved by the Federal Transit Administration (FTA). During the periods between baseline checks, checks are only made at maximum load points.

During the reporting period, each line was checked at its maximum load point (MLP) for two days from 5 AM – 7 PM. Some lines were checked only at one MLP, while others were checked at several MLPs (different points were checked for different time periods for some lines). Because the software system only recognizes published time points, the MLP was chosen to correspond to a time point as close as possible to the true MLP. The two-day check data was averaged, and the average load and number of trips were then calculated.

The computer software automatically calculated the number of trips that needed to be checked for statistical significance. Extra checks were often made in order to ensure a valid count.

Annual ridership calculations for individual lines are subject to a greater error than the annual ridership calculation for the entire system. For the annual system-wide ridership estimate, there is a 95% chance that the estimate is within ±10% of the actual annual ridership based on this approved sampling methodology.

Verification of Reported Performance During the Audit Period

Data reported in the Service Standards Reports were compared to that reported in the Federal Transit Administration's (FTA) National Transit Database (NTD). (All data reported to the NTD are audited regularly by the FTA.) All data were found to be consistent.

Problems or Issues Identified During the Audit Period

No significant problems or issues were identified.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni adjusted the milestones to compare passenger boardings to the previous year. The milestone for FY2003 and FY2004 was:

- 224 Million Passenger Boardings

Auditor Recommendations

The definition of measurement should be amended to remove the statement, "Data will be reported to the board on a quarterly basis."

Realistic goals for ridership should be established based on economic conditions as well as available service.

2b. *Fare revenue generated by mode.*

Goal:	To increase fare revenue overall by $1.6M compared with FY2000
Purpose:	Measure fare revenue by mode, as well as by General Fast Pass Sales
Definition of Measurement:	Fare revenue collection on board revenue vehicles, as well as sales of individual tickets and passes of all types, including shares of regional passes such as BART + and special event passes.
Method of Measurement:	Cash fares are collected electronically on board all revenue vehicles (with the exception of Cable Car), utilizing the Cubic Farebox system. In Cable Car, a manual fare collection system along with sale of special passes is utilized. POP stations sell tickets at the platform.
Milestones:	FY2001 – fare revenue increase of $1.96 M exceeded standard FY2002 – fare revenue increase of $2.08 M exceeded standard

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

The established goal of increasing fare revenue by $1.6 M over FY2000 fare revenue was accomplished for both FY2001 and FY2002. Muni was unable to achieve the target revenue of $100 M in FY2003. Table B-2 summarizes data on fare revenue for FY2000 – FY2003.

Table B-2 Annual Cash Fare Summary, FY2000 – FY2003

Mode	**Annual Cash Fare Summary**						
	FY2000	FY2001	Improvement FY2000 to FY2001	FY2002	Improvement FY2000 to FY2002	*F2003*	*Improvement FY2000 to FY 2003*
Motor Coach	$15,067,705	$14,504,449	-$563,256	$15,949,862	$882,157	*$14,040,087*	*-$1,027,617*
Trolley Coach	$13,881,967	$13,576,560	-$305,407	$13,431,373	-$450,594	*$12,249,779*	*-$1,632,188*
Light Rail	$8,542,470	$9,555,224	$1,012,754	$8,254,448	-$288,022	*$7,910,161*	*$-632,309*
Cable Car	$12,835,482	$12,385,510	$449,964	$12,385,518	-$449,964	*$11,008,050*	*-$1,827,432*
Fast Pass Sales	$45,427,773	$47,252,188	$1,824,415	$47,537,277	$2,109,504	*$44,817,894*	*-$609,879*
Other Media	$5,554,630	$5,902,166	$427,536	$5,731,066	$176,436	*$6,255,035*	*$700,405*
Paratransit	$764,616	$782,230	$17,614	$865,741	$101,125	*$1,071,099*	*$306,483*
Charter Service						*$15,609*	*$15,609*
Total	$102,074,643	$104,038,335	$1,963,692	$104,155,285	$2,080,642	*$97,367,714*	*-4,400,445*

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004

Data in italics have not been audited

Verification of Definition and Method of Measurement During the Audit Period

Fare revenue data were collected by the Revenue Department and reported monthly to the Finance Department. The Revenue Department provided information on pass sales and sales of other media as well as revenue collected on board vehicles. The Revenue Department provided revenue by division, which enabled Finance to allocate cash revenue by mode.

The auditor was unable to verify that the reports provided to Finance accurately reflected the amount of revenue collected, however a review of the controls on revenue data showed a highly controlled and automated environment that meets FTA audit requirements.

Verification of Reported Performance During the Audit Period

Based on an audit of the monthly revenue reports and the calculations completed by the Finance Department, all revenue data appeared to be reported correctly.

Problems or Issues Identified During the Audit Period

Performance in FY2001 and FY2002 were both compared with FY2000 and were both found to exceed the standard.

Assuming each fiscal year was intended to be compared to the prior year's performance, and not to the FY2000 benchmark, the following result is calculated:

Mode	Annual Cash Fare Summary				
	FY 99/00	FY 00/01	Improvement FY2000 to FY2001	FY 01/02	Improvement FY2001 to FY2002
Motor Coach	$15,067,705	$14,504,449	-$503,250	$15,940,802	$1,445,413
Trolley Coach	$13,881,967	$13,576,560	$305,407	$13,431,373	$145,187
Light Rail	$8,542,470	$9,555,224	$1,012,754	$8,254,448	$1,300,776
Cable Car	$12,835,482	$12,385,518	-$449,964	$12,385,510	$0
Fast Pass Sales	$45,427,773	$47,252,188	$1,824,415	$47,537,277	$285,080
Other Media	$5,554,630	$5,982,166	$427,536	$5,731,066	$251,100
Paratransit	$764,616	$782,230	$17,014	$805,741	$03,511
Total	$102,074,643	$104,038,335	$1,963,692	$104,155,285	$116,950
Percent Change		2%			0.1%

In this case, the milestone of a $1.6 M increase in fare revenue was exceeded in FY2001. In FY2002, the target of an additional $1.6 M increase in fare revenue was substantially missed, with only a $116,950 increase in fare revenue between FY2001 to FY2002.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni adjusted the milestones to a fixed milestone, rather than comparing fare revenues to the previous year. The FY2003 and FY2004 milestones were:

- Achieve $100 M in fare revenue in FY2003
- Achieve $117 M in fare revenue in FY2004

Action Plan

Fare revenue is an important management tool, and can be a surrogate for ridership during periods of fare stability. Combined with other indicators, it is possible to calculate average fare per passenger, a useful management tool when looking at alternative fare structures.

Wile this indicator should be continued, the current practice of changing the benchmark for fare revenue annually based on the prior year actual experience does not allow for reasonable comparison across time. Rather than continuing to alter the benchmark, it is recommended that the milestone be restated: "Fare revenue should increase by 1.5% per year compared with prior year performance."

Changing the milestone in this way will allow for comparisons over time, and will serve as a better indicator of the need to adjust fares and fare structure.

3b. *Hours and miles operated by mode.*

Goal:	To increase hours and miles operated by mode by 1.2%
Purpose:	Measure the distribution of miles and hours traveled by mode.
Definition of Measurement:	The miles and hours that vehicles travel while in revenue service. Vehicle revenue miles and revenue hours exclude travel to and from storage facilities, training operators prior to revenue service, road tests and deadhead travel, as well as charter service.
Method of Measurement:	Reported from schedules, excluding any service interruptions or special additional service.
Milestones:	1.2%

From *Muni Service Standards Report, FY 2001 and FY2002*

Reported Performance

Data for hours and miles are reported annually, with data from the previous year reported for the current fiscal year (i.e., for the FY2002 Service Standards Report, hours and miles for FY2001 was reported). This is due to the fact that final mileage and hour calculations cannot be completed until several months after the conclusion of the fiscal year.

For both FY2000 and FY2001, systemwide mileage and hour increases exceeded the goal of 1.2% growth from the previous year. However, this growth was not distributed evenly among all modes. The most significant gains were for light rail. This trend continued in FY2002 and FY2003. Table B-3 summarizes the hours and miles and percent change in hours and miles for fiscal years 1999, 2000, 2001, 2002 and 2003.

Table B-3 Revenue Hours and Miles, FY1999 – FY2003

	FY1999		FY2000		FY2001		% Change FY99-00		% Change FY00-01		*FY 2002*		*FY 2003*		% Change FY01-02		% Change FY 02-03	
	Hours	Miles	Hours	Miles	Hours	Miles	Hours	Miles	Hours	Miles	*Hours*	*Miles*	*Hours*	*Miles*	Hours	Miles	Hours	Miles
Motor Coach	1,376,950	12,388,078	1,377,052	12,395,536	1,405,682	12,477,997	0.01%	0.06%	2.1%	0.7%	*1,544,410*	*13,427,575*	*1,661,644*	*15,463,238*	9.9%	7.6%	7.6%	15.2%
Trolley Coach	1,006,692	7,027,340	1,014,636	7,064,874	1,015,643	7,024,834	0.8%	0.5%	0.1%	0.6%	*1,056,197*	*7,281,249*	*1,070,171*	*7,367,769*	4.0%	3.7%	1.3%	1.2%
Light Rail Vehicle	426,396	4,015,172	474,018	4,314,232	518,097	4,738,100	11.2%	7.4%	9.3%	9.8%	*571,349*	*5,461,609*	*577,018*	*5,531,119*	10.3%	15.3%	1.0%	1.2%
Cable Car	121,044	494,485	129,672	523,642	128,893	494,650	7.1%	5.9%	0.6%	5.5%	*116,501*	*441,266*	*126,171*	*406,091*	9.6%	10.8%	7.5%	8.2%
TOTAL	2,931,082	23,925,075	2,995,378	24,298,284	3,068,321	24,735,581	2.2%	1.6%	2.4%	1.8%	*3,307,543*	*26,613,698*	*3,434,404*	*28,767,206*	7.8%	7.6%	3.8%	8.1%

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*
Data in italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

Annual hours and miles were calculated from schedules. The number of miles was derived from the number of hours and the average travel speed of vehicles. Missed service (from the Missed Service Report) was subtracted from the number of scheduled hours and miles to determine the actual number of miles and hours.

Verification of Reported Performance During the Audit Period

Data reported in the Service Standards Reports were compared to that reported in the Federal Transit Administration's (FTA) National Transit Database (NTD). (All data reported to the NTD are audited regularly by the FTA.) All data were found to be consistent, with the exception of the number of miles and hours reported for motorcoach in FY2001. The number of hours and miles reported in the Service Standards Report was 1,405,682 hours and 12,477,997 miles. The number of hours and miles reported to NTD was 1,405,628 hours and 12,447,997 miles. (It seemed as though numbers were mistakenly inverted in the Service Standards Report.)

Problems or Issues Identified During the Audit Period

No problems or issues were identified, however much of the hours and miles data must be tabulated manually, which is quite time intensive. Once the new Trapeze scheduling software is implemented, most of the calculations can be performed automatically, which should save a significant amount of staff time.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni adjusted the milestones to a fixed milestone, rather than comparing fare revenues to the previous year. The FY2003 and FY2004 milestones were:

- Revenue Hours Goal: 3.6 M hours in FY2003 and 3.5 M hours in FY2004
- Revenue Miles Goal: 25 M miles in FY2003 and FY2004

Action Plan

While there were no problems identified with the collection or reporting of data, it should be noted that miles and hours of service are a direct reflection on the available budget. It is not reasonable to expect that in times of budget constraints miles and hours of service will continue to increase, or even remain constant.

Miles and hours of service are important inputs to the National Transit Database reporting, and will be calculated annually whether or not they continue to be used as a performance measure. However, it is recommended that this NOT be continued as a service standard at this time.

4b. *Expenses incurred by mode.*

Goal:	Expenses by Mode in each Fiscal Year to remain within budgeted amount.
Purpose:	Measure the cost of producing revenue service by mode as well as budget adherence.
Definition of Measurement:	Expenses collected by mode, exclude Worker's Comp, Paratransit Contract, Judgments and Claims, Interfund transfers, use of Muni fast passes on BART, Benefits for retirees, long term leaves, and services of the City attorney
Method of Measurement:	Budget expenses are tracked by line item and section but are rolled up into mode annually. Data reported on an annual basis.
Milestones:	FY2001 – expenses are within budget FY2002 – expenses are within budget

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

The annual Service Standards Report simply reports whether costs are within budget or not. In both audit years, costs were reported within budget.

Verification of Definition and Method of Measurement During the Audit Period

Muni's expenses were allocated to expense codes in four major categories:

- Vehicle (including driver wages);
- Vehicle maintenance;
- Administration; and
- Non Vehicle Maintenance (i.e., Facilities).

Within each category, the mode can be coded, to allow costs to be tracked by mode. While many costs track directly to mode in a straightforward manner, costs, such as most administrative costs, must be allocated to a mode using a system approved by FTA for the National Transit Database. The methodology, approved in 1987, allows Muni to allocate non-mode specific costs to each mode through a formula based on the revenue miles by mode.

The measurement reported in the Service Standard Reports was consistent with the NTD information and is derived from NTD reports. The actual measurement is slightly different from the method described in the table above. In fact, a correct statement of measurement would be:

> *Expenses collected and allocated by mode, exclude Worker's Comp, use of Muni fast passes on BART, benefits for retirees not paid by Muni, and non-compensated long term leaves.*

This definition is consistent with the NTD report, and therefore more accurately reflects what is currently being reported.

Verification of Reported Performance During the Audit Period

The audit team confined its investigation to the reporting done by the Finance Department. The auditor was therefore unable to comment on the accuracy of costs reported to each budget line item. However, the audit examined the process and controls involved in preparing the expenditure reports that are used in NTD and Service Standard reporting. All appropriate controls appeared to be in place to track costs by mode in an acceptable manner.

Problems or Issues Identified During the Audit Period

The Service Standard Report simply states whether or not Muni was "in budget" by mode. It does not provide modal comparisons, nor does it provide line item expenses. Even the information presented is a bit misleading, since some elements of the Muni budget are not mode specific, although they are ultimately allocated by mode based on the NTD formulas.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, nor the milestone.

Action Plan

This goal and the information presented has limited value to the public or to Muni itself. In fact, Muni has no opportunity to exceed its budget without receiving a supplemental appropriation, as a City agency cannot operate in deficit. Rather than comparing expenses to budget by mode, which is an artificial comparison, it is recommended that Muni track fully allocated costs per hour of service by mode. This standard industry benchmark would allow Muni to compare its unit costs against other similar properties nationwide. This information is calculated by the Finance Department regularly for the NTD report, and would not require additional effort.

A recommended performance measurement system would include:

Goal:	Fully allocated unit cost per hour for each mode will not increase by more than the Bay Area CPI annually.
Purpose:	Measure the cost of producing revenue service by mode as well as the ability to control unit costs.
Definition of Measurement:	Expenses collected and allocated by mode will be based on the NTD methodology, (exclude Worker's Comp, use of Muni fast passes on BART, benefits for retirees not paid by Muni, and non-compensated long term leaves) divided by the number of hours operated by mode to calculate unit costs per hour.
Method of Measurement:	Expenses by mode are calculated using an NTD approved methodology on an annual basis. Annual hours by mode are calculated using an NTD approved methodology on an annual basis.
Milestones:	Costs per hour of service for each mode shall not exceed the Bay Area CPI in each year.

C. *Staffing Performance*

The Proposition E Service Standards for staffing performance focus on staffing levels and the ability to retain new employees. They include:

- 1c. Net vacancies by position (vacancies remaining once promotions and new hires have been deducted from retirees or resignations) for each division.
- 2c. Attrition rates for new employees, by division and level.

Key Recommendations

The following are key recommendations based on the findings of our audit of FY2001 and FY2002 Service Standards data and on trends observed in unaudited FY2003 and FY2004 Service Standards data:

- For Service Standard 1c, the great majority of vacancies cannot be filled due to budgetary policies. In order to ensure that service provision does not suffer, Muni has focused on making sure that maintenance and operator positions are filled. Consequently, the auditor recommends that this Service Standard be limited to Transit Operators and Maintenance personnel, or that the goals for other divisions (exclusive of Transit Operators and Maintenance personnel) be revised so that they can be reasonably met given budgetary constraints.
- In order to track the attrition rate for new hires in Service Standard 2c, attrition rates should either be reported at the end of new employees' probationary periods or within one year after hire. To calculate attrition, only those employees who separate after six months or one year of service should be counted. Furthermore, there is no information provided in this measure about why employees are voluntarily separating from Muni service. If it is possible to obtain this information from the Position Control System database, then it should also be summarized and included in this measurement.

1c. Net vacancies by position (vacancies remaining once promotions and new hires have been deducted from retirees or resignations) for each division.

Goal:	No greater than 5% vacancy rate.
Purpose:	Efficiency level of the department in hiring.
Definition of Measurement:	Monthly measurement of net vacancies against budgeted positions by division.
Method of Measurement:	The Vacancy Report will be the basis of the data reported to the Board on a quarterly basis.
Milestones:	5%

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

The number of budgeted positions and the number and percentage of vacancies at the beginning and end of each quarter were reported. Table C-1 shows the percentage of scheduled positions that were vacant at the end of the fourth quarter for fiscal years 2001, 2002 and 2003 as well as at the end of the first quarter of FY2004. Overall, Muni met its goal of having a vacancy rate of less than 5% for all four years. The vacancy rate for transit operators was the lowest, while that for finance and administration, GM Programs/Safety and Training was highest.

Table C-1 Vacancy Rate, FY2001 – FY2004

	FY2001		FY2002		FY2003		FY2004	
Division	**Budgeted Positions**	**Vacancies at End of 4th Quarter**	**Budgeted Positions**	**Vacancies at End of 4th Quarter**	**Budgeted Positions**	**Vacancies at End of 4th Quarter**	**Budgeted Positions**	**Vacancies at End of 1st Quarter**
Transit Operators	2,176	1.9%	2,176	1.1%	*2,163*	*0%*	*2,163*	*0%*
Maintenance/Ops Administrative	1,540	6.6%	1,639	5.1%	*1,749*	*6.7%*	*1,685*	*7.7%*
Finance and Administration	244	10.7%	222	8.6%	*240*	*12.9%*	*242*	*10.7%*
GM Programs/Safety & Training	253	8.3%	161	17.4%	*158*	*18.9%*	*203*	*14.8%*
Totals	4,213	4.5%	4,199	3.7%	*4,310*	*4.2%*	*4,293*	*4.3%*

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004

Data in italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

The Annual Salary Ordinance was used to determine the number of budgeted positions for each fiscal year. "Vacancies" were any type of permanent separation, including releases, dismissals, retirements and transfers. Leaves were not counted as vacancies. Vacant positions were tabulated using the Position Control System database. The database was queried for all vacancies, since it cannot create separate vacancy queries for each department. (This was done manually.) Staff checked to ensure that vacancies tabulated for the end of the previous quarter matched the number of vacancies reported for the beginning of the subsequent quarter.

Verification of Reported Performance During the Audit Period

Based on an audit of data for the third quarter of FY2002, vacancy rates appear to have been calculated and reported correctly.

Problems or Issues Identified During the Audit Period

If the Position Control System database could be queried to report the number of vacancies by department, it would save a significant amount of staff time.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, nor the milestone.

Auditor Recommendations

The great majority of vacancies cannot be filled due to budgetary policies. In order to ensure that service provision does not suffer, Muni has focused on making sure that maintenance and operator positions are filled. Consequently, the auditor recommends that this Service Standard be limited to Transit Operators and Maintenance personnel, or that the goals for other divisions (exclusive of Transit Operators and Maintenance personnel) be revised so that they can be reasonably met given budgetary constraints.

2c. Attrition rates for new employees, by division and level.

Goal:	No greater than 10%
Purpose:	Measurement of effectiveness of recruitment and employee satisfaction by the rate of voluntary separations for new employees.
Definition of Measurement:	Number of employees by division and class who are released during probationary period or who are voluntarily separated during probation. Will break down attrition within probationary period, as well as attrition one year after hire. Data will be reported to the board on a quarterly basis.
Method of Measurement:	Vacancy Report will provide data for quarterly reporting.
Milestones:	10%

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

Each quarter, the number of new hires, releases, and voluntary separations that occur within each division were reported. The attrition rate was calculated by dividing the total number of releases and voluntary separations that occur within a quarter by the total number of new hires within that quarter. During the two fiscal years audited, Muni never achieved an attrition rate lower than 11% (which occurred during the first quarter of FY2001). Attrition rates remained high in FY2003 and FY2004, as shown in Table C-2.

Table C-2 Attrition Rate, FY2001 – FY2004

	4th Quarter FY2001			4th Quarter FY2002			4th Quarter FY2003			1st Quarter FY2004		
	# of Hires	Total Separations	Attrition Rate	# of Hires	Total Separations	Attrition Rate	# of Hires	Total Separations	Attrition Rate	# of Hires	Total Separations	Attrition Rate
Operators	90	44	48.9%	31	39	125.8%	*25*	*11*	*44.0%*	*44*	*14*	*31.8%*
Crafts	34	3	8.8%	12	1	8.3%	*4*	*3*	*75.0%*	*0*	*2*	*0.0%*
Maintenance	25	2	8.0%	9	2	22.2%	*0*	*0*	*0.0%*	*1*	*3*	*300.0%*
Ops/Admin	25	0	0.0%	8	1	12.5%	*1*	*0*	*0.0%*	*9*	*2*	*22.2%*
Finance & Admin	18	1	5.6%	2	3	150.0%	*2*	*5*	*250.0%*	*4*	*2*	*50.0%*
GM Program/PEA/S&T	9	2	22.2%	2	3	150.0%	*0*	*0*	*0.0%*	*1*	*0*	*0.0%*
Total	201	52	25.9%	64	49	76.6%	*32*	*19*	*59.4%*	*59*	*23*	*39.0%*

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004

Data in italics have not been audited

The attrition rates reported in the Service Standards Reports do not accurately represent actual attrition rates for new employees, however. The rate was based on the number of people who were hired or who separated during a quarter, however the employees who separated during a quarter were not necessarily the same as those who were hired during that quarter. Furthermore, voluntary separations included anyone who voluntarily separated, regardless of their length of employment. This issue is discussed further in the subsequent sections.

Verification of Definition and Method of Measurement During the Audit Period

The Position Control System database was used to determine the number of new hires, releases and voluntary separations within each quarter. Releases were counted as those staff who were released for disciplinary or non-disciplinary reasons during their probationary period (typically the first six months of employment). Voluntary separations included staff who either quit work or transferred. It did not include retirements. The number of voluntary separations reported in a given quarter were for anyone who left during that quarter, regardless of the length of his or her employment.

Verification of Reported Performance During the Audit Period

Based on an audit of data for the third quarter of FY2001, attrition rates were not calculated correctly. Voluntary separations included all employees who separated from Muni during a particular quarter, regardless of their length of employment.

Problems or Issues Identified During the Audit Period

Attrition rates were not reported for both the probationary period and for one year after hire, per the stated definition of measurement. Either data should be tabulated differently, or the stated definition of measurement should be amended as follows: "Will break down attrition within probationary period."

The reporting methods used during FY2001 and FY2002 do not provide information on the attrition rates for new employees. The employees who were hired within a particular quarter were not necessarily the same employees who separated within that same quarter.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, nor the milestone.

Auditor Recommendations

In order to track the attrition rate for new hires, attrition rates should either be reported at the end of new employees' probationary periods or within one year after hire. To calculate attrition, only those employees who separate after six months or one year of service should be counted. Furthermore, there is no information provided in this measure about why employees are voluntarily separating from Muni service. If it is possible to obtain this information from the Position Control System database, then it should also be summarized and included in this measurement.

D. *Customer Service*

Customer service addresses passenger safety on board vehicles and at stops; the ease with which passengers can navigate and use the transit system to get where they need to go in a timely and efficient manner; the availability of information about schedules, delays or other service interruptions; and the responsiveness of transit agency staff when customer problems or complaints arise. Proposition E includes the following Service Standards aimed at measuring customer service:

- 1d. Development of an annual marketing plan identifying specific programs and projects that will promote increased patronage.
- 2d. Publication and distribution to the public of schedules for all trips taken by all vehicles that shall consists of specific arrival times at terminals and established intermediate points.
- 3d. Operator conduct complaints.
- 4d. Annual passenger surveys and follow-up by management.
- 5d. Improvements in public information regarding vehicle delays during operations as well as any general user information regarding system modifications, route changes, and schedules.
- 6d. Efforts to improve driver training, technical as well as accident follow-up.
- 7d. Number of crime incidents on Municipal Railway vehicles or in Municipal Railway facilities.

Key Recommendations

The following are key recommendations based on the findings of our audit of FY2001 and FY2002 Service Standards data and on trends observed in unaudited FY2003 and FY2004 Service Standards data:

- For Service Standard 1d, marketing priorities should be made within budget constraints and with the goal of increasing patronage; data from ridership surveys should be used to evaluate the success of marketing efforts.
- For Service Standard 2d, the current process of schedule preparation is cumbersome, time consuming, and relies on the background and knowledge of one key staff person. The capabilities of the new Trapeze software should be fully utilized in order to simplify and streamline the process of schedule preparation.
- For Service Standard 3d, operator conduct complaints need to be more clearly measured and reported, realistic goals for reducing the number of operator conduct complaints should be established, and the efficiency and accuracy of complaint information uptake should be improved.

- To be truly useful, Service Standard 5d should be divided into two goals to distinguish between routine information provided in real time and longer-term information provided as part of service or schedule change and/or construction projects. To further differentiate between immediate information provided to passengers on the system during delays or other unusual events, and longer-term information provided to address construction or other longer-term events, the following systems of measurement are recommended:

Goal:	Improve Real-Time Passenger Information regarding service delays.
Purpose:	Provide the public with information regarding service delays that will enable them to make choices about their trip.
Definition of Measurement:	Improve passenger information by communication of service problems and other information to each vehicle, the station platforms, the Telephone Information Center, media, the Service Hotline, and Service Quality Teams. Operators will make passenger announcements in all cases where service delays exceed 3 minutes in the subway and 10 minutes on surface lines. Central Control will make both visual and verbal announcements in all stations where service delays exceed 3 minutes on all LRV lines. Service Quality Teams will be assigned to all unscheduled service disruptions exceeding two hours.
Method of Measurement:	Central Control logs. Passenger Satisfaction Surveys.
Milestones:	95% of all delays of 3 minutes or more reported via station address system. Service Quality Teams assigned to all unscheduled service disruptions exceeding 2 hours. 75% of all passengers returning surveys indicate that information regarding service delays is adequate and useful.

- In order to meet the accident reduction goals established in Service Standard 6d, it will be necessary to develop a comprehensive approach and coordinated effort to reduce accidents across divisions and departments. Driver training was found to be sufficient. Therefore, the focus of accident reduction efforts should be enforcement of safety rules and procedures and accident prevention through thorough review of all accidents.

1d. Development of annual marketing plan identifying specific programs and projects that will promote increased patronage.

Goal:	Develop Marketing Plan by January 1, 2001
Purpose:	To produce a variety of marketing tools that will provide the public with an incentive to utilize the services of Muni.
Definition of Measurement:	Marketing plan developed.
Method of Measurement:	Marketing Plan completed and approved for implementation.
Milestones:	FY2001 – Marketing Plan published FY2002 – Marketing Plan published

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance During the Audit Period

Marketing Plans were published in both FY2001 and FY2002.

Verification of Definition and Method of Measurement During the Audit Period

Muni's Marketing Director provided copies of the FY2001 and FY2002 Marketing Plans as well as samples of marketing materials that were produced.

Verification of Reported Performance During the Audit Period

Marketing Plans were published in both FY2001 and FY2002.

Problems or Issues Identified During the Audit Period

Overall, marketing plans were too ambitious for the budget provided. More strategic goals and objectives should be set, including some method of feedback or evaluation to know that the marketing actions are achieving the expected results. For example, targeted programs for off-peak riders should be measured by ridership changes after program implementation.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has continued to set a January 1 milestone for completion and approval for implementation of the Marketing Plan.

Action Plan

Budget and policy planning could be better coordinated so that the most cost effective and most essential marketing activities are funded. The marketing plan identifies activities that should be undertaken, but where there is insufficient budget, the process of priority setting becomes ad hoc or driven by the opportunity for outside funding. (Note: Significant improvements have been made in this area since the completion of the audit period and may be further investigated in the subsequent task to develop action plans.)

Key problems and actions include:

- **Setting priorities for marketing efforts** – The marketing plan sets out objectives for improving Muni's image and developing ridership in targeted markets. Staff has been very creative in developing and implementing initiatives to date, but with a constrained budget, staff should set priorities for those initiatives that best achieve the goal of increased patronage.
- **Utilizing data from ridership surveys to evaluate success** – There is no quantitative measurement established for this performance goal; however, data from ridership surveys should be used to determine whether focused marketing is creating the changes in ridership anticipated. For example, if the objective is to increase off-peak ridership (on certain lines, line segments, or systemwide) then operations data collected could indicate the change, and the ridership survey provide the reasons for that change.

2d. Publication and distribution to the public of schedules for all trips taken by all vehicles that shall consist of specific arrival times at terminals and established intermediate points.

Goal:	Publish a complete timetable by January 1, 2001
Purpose:	Provide riders with an updated schedule.
Definition of Measurement:	Publication and distribution of schedules for all trips taken by all vehicles that shall consist of specific arrival times at terminals and established intermediate points.
Method of Measurement:	Distribution of the timetable to the public. Muni is in the process of reviewing the schedules of all the lines. Once the review is complete, we will publish schedules for individual lines, as well as an updated system-wide schedule.
Milestones:	FY2001 – Printing and distribution of timetable FY2002 – Printing and distribution of timetable

From *Muni Service Standards Report, FY 2001 and FY2002*

Reported Performance During the Audit Period

Muni published and distributed a complete timetable for 2001 on August 18, 2001, and a complete timetable for 2002 on August 31, 2002.

Verification of Definition and Method of Measurement During the Audit Period

Schedules were developed from the database of the actual runs bid on in the Scheduling Department. When a new driver sign-up occurred, the Scheduling Department developed the run cuts and assignments. This information was then sent to the Information Technology Department where staff converted the data into an Excel spreadsheet file. This Excel file was then sent to Planning Division staff, who reviewed and conferred with Scheduling about any changes. Schedule changes were not flagged automatically; recognition of changes depended on the staff person's knowledge of the system. Materials were edited and then sent to the publisher.

Verification of Reported Performance During the Audit Period

Two printed timetables have been published during the audit period. The first, published on August 18, 2001, was completed in a very short time with the extensive use of interns. The second was published on August 31, 2002. The timetables were distributed in buses, Metro stations, City Hall (Info Desk and the Treasurer's Office) and the Main Library. Staff also filled mail order requests, and the information was made available on the Muni and regional transportation websites.

Problems or Issues Identified During the Audit Period

With the full implementation of the new Trapeze software, staff will have the ability to overlay new schedules on existing ones for a quicker and more efficient understanding of any changes. Currently, the process is cumbersome, time-consuming and reliant upon the background and knowledge of one key staff person.

No new timetable is expected to be published for 2003 due to the high expense. Staff is identifying alternative media for reaching riders.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni adjusted the milestones to timetable publications to the previous year. The FY2003 and FY2004 milestones were/are:

- FY2003 – Publish timetable
- FY2004 – Publish a complete timetable during FY2004

Action Plan

The auditor identified schedule preparation timeliness and efficiency as a key issue for this Service Standard. The current process for preparation of the schedules is cumbersome, time-consuming and reliant upon the background and knowledge of one key staff person. Timely response to changes, for example, those resulting from the proposed FY2004/2005 budget, is difficult. Ultimately, full implementation of the Trapeze software will allow staff to overlay new schedules on existing ones for a quicker and more efficient understanding of the changes and should allow quicker response. However, staff must be adequately trained in the use of the software, or work practices will continue as they are at present.

3d. Operator conduct complaints.

Goal:	75% of all Passenger Service Reports will be resolved in 30 days and 10% reduction of Passenger Service Reports annually.
Purpose:	Monthly measurement of customer satisfaction with the agency as well as measuring the effectiveness of internal process to address the complaints.
Definition of Measurement:	Muni will make available a summary of complaints received, resolved and outstanding on a quarterly basis.
Method of Measurement:	Data provided from the Passenger Service Report Unit will be reported to the Board on a quarterly basis.
Milestones:	75% within 30 days and 10% annual reduction

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

In FY2001, 90% of Operator Complaints were resolved within the 30-day timeframe, meeting the stated goal of 75% resolution within 30 days. In FY2002, only 70% were resolved within the timeframe, and the 75% goal was not met. Performance improved in FY2003, and the 75% goal was achieved. Table D-1 shows the percentage of operator complaints resolved within 30 days (the number of complaints closed within the timeframe divided by the number of complaints recommended for neutral hearings) for FY2001 – FY2004.

Table D-1 Percent of Operator Complaints Resolved in 30 Days, FY2001 – FY2004

	FY2001	FY2002	FY2003	1st Quarter FY2004
# of operator complaints requiring follow-up	733	645	*479*	*337*
# recommended for neutral hearings	303	284	*124*	*62*
# closed within the time frame	272	199	*97*	*35*
% closed within the time frame	90%	70%	*78%*	*57%*

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004
Data in italics have not been audited.

As shown in Table D-2, total complaints were reduced by 5% between FY2000 and FY1999. However, Muni did not attain its goal of a 10% reduction in complaints in FY2001, FY2002, or FY2003. In FY2001, the number of complaints exceeded the goal by 2,454. In FY2002, the number of complaints exceeded the goal by 1,733. This trend continued in FY2003, when the number of actual complaints exceeded that goal by 704.

Table D-2 Total Number of Passenger Service Reports, FY1999 – FY2004

Target	FY 99 Actual	FY 00 Actual	FY 01 Actual	FY 01 Goal	FY 02 Actual	FY 02 Goal	FY 03 Actual	FY 03 Goal	1st Q FY04 Actual	1st Q FY04 Goal
Reduce PSR's by 10%	12,456	11,674	12,931	10,507	13,373	11,640	*12,740*	*12,036*	*711*	*704*

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004

Data in italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

A detailed process manual and flow chart dictated how complaints were recorded and resolved. Data were collected and analyzed in accordance with this manual and the described definition and method of measurement.

Verification of Reported Performance During the Audit Period

Based on an audit of data from FY2001 and the first through third quarters of FY2002, performance appears to have been reported correctly.

Problems or Issues Identified During the Audit Period

In FY2002, approximately 50% of driver complaints referred for administrative hearing were dropped because of failure of the complainant to attend the hearing. Because of this situation, a new procedure for handling driver complaints went into effect on July 1, 2003. The major change was at the Division level, where instead of automatic administrative hearings, there is a now a consultation between management and labor as to the appropriate action, with the goal of empowering management and looking for ways to retrain and support drivers.

In both FY2001 and FY2002, Muni was unable to meet its goals for reducing the number of Passenger Service Reports. This will be investigated further in the subsequent task to develop action plans to improve performance.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, nor the milestones.

Action Plan

This action plan focuses on three key issues identified by the auditor:

- Clarity on what performance is being measured
- A need for realistic goals
- Efficiency and accuracy of complaint information intake

Clarity on what Performance is Being Measured

The operator conduct data is reported through the Passenger Service Report (PSR) database. The service standard is specific to operator conduct, not the whole universe of PSR's. Measurement should focus on the nature and disposition of the operator conduct complaints; the FY2004 Service Standard Reports are now more clearly and appropriately focused. However, the metric reported is still total PSR's, not operator conduct complaints. This should be revised to properly reflect the intent of the performance standard. Staff should also clarify in the decision flow chart the criteria and process through which the intake numbers on operator conduct complaints are reduced to non-actionable items, since a large percentage do not go forward due to such problems as lack of information, no customer identification, or the described action is not considered an infraction of Muni rules. The auditor also recommends deleting commendations and station ops from the totals, since they do not have to do with complaints about operator behavior and confuse the understanding of the goal for reduction.

It makes sense to have the 30-day standard apply only to the actionable operator complaints, with the assumption that all other operator conduct complaints have been suitably disposed of. A reporting format that shows total actionable items pending and length of time each quarter would be more useful than just showing totals. It is not clear to the reader whether the quarterly totals are the number received or the number pending. The information system should be able to generate a report at any time (not just quarterly) that shows total pending operator conduct complaints and time lapsed for each.

A Need for Realistic Goals

The continued 10% annual reduction in PSR's is not a realistic goal without some kind of qualifier such as a multi-year timeframe or target threshold. The goal needs to address the following question: What is the acceptable level of operator conduct complaints in the organization? In other words, what would represent not just improvement, but success? One suggestion is to look at the ultimate target in relationship to other related goals, such as operator training or service reliability. Since, at Muni, there is a historical relationship between service reliability and operator conduct complaints, a realistic target might be to reduce complaints to a certain level and then not have them exceed service reliability indices.

In setting a base target, data from other systems could give an indication of some appropriate levels. For example, Sacramento has an average of 3,000 total PSR's (approximately 66% of these are operator conduct complaints) quarterly and a daily ridership base of 100,000. Muni needs to determine what the acceptable target number of total PSR's should be and the percentage of those PSR's that are attributable to operator conduct given Muni's much more congested environment and a daily ridership of over 700,000. The understanding is that these goals work together, in that reducing resolution time will ultimately result in changed operator behavior and fewer complaints; however, expecting a 10% reduction indefinitely from year to year is not a realistic goal.

Efficiency and Accuracy of Complaint Information Intake

The majority of the operator conduct complaints are recorded by hand during telephone conversations. Other complaints are received by written/mailed or email correspondence. Personnel who take the information should be proficient in data input directly onto the electronic form as it is communicated to them. This would greatly improve efficiency and reduce the chance of error. If personnel do not have the skills to perform these functions, training should be provided. Improved intake could also affect the number of complaints that are actionable (require follow-through).

4d. Annual passenger surveys and follow-up by management.

Goal:	Conduct a Rider Survey and an Employee Survey.
Purpose:	Measure the level of satisfaction of transit riders and employees. Use the results of the survey to implement improvements.
Definition of Measurement:	Conduct an annual survey of riders and hold focus-group meetings to determine riders' sentiments and concerns. Surveys will include an Employee Survey along with a Rider Survey.
Method of Measurement:	Successful completion of the surveys prior to the end of FY2001 and FY2002 and present findings to Board and Citizens Advisory Committee.
Milestones:	FY2001 – Survey conducted in June 2001FY2002 – Survey conducted in July 2002

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance During the Audit Period

Results of the FY2001 Rider survey were presented to the MTA Board on August 7, 2001, following presentation to the Citizen's Advisory Committee (CAC). Another Rider survey was conducted in July 2002. Employee surveys were conducted in June 2001 and June 2003. Focus group meetings, as stated in the Definition of Measurement, were not held.

Verification of Definition and Method of Measurement During the Audit Period

The rider and employee surveys were conducted by the firm of David Binder Research under contract to Muni. Four hundred respondents aged eighteen or older who rode Muni in the past six months were interviewed on June 1st – 3rd, 2001 and July 21st – 24th, 2002. These riders were randomly selected residents of the City of San Francisco with working telephone numbers that met the aforementioned criteria. Results for both surveys were subject to a sampling error of 4.9%.

In June 2001, employee survey results were obtained from 921 self-administered questionnaires from employees in ten departments, with the majority coming from Transportation and Maintenance. In June 2002, results were obtained from 504 self-administered questionnaires from employees in 12 departments, with the majority again coming from Transportation and Maintenance.

Verification of Reported Performance During the Audit Period

Rider Surveys were conducted in June 2001 and July 2002. Employee surveys were conducted in June 2001 and June 2002.

Problems or Issues Identified During the Audit Period

Completion of the surveys and communication of the information to the Board accomplishes the first part of the goal. However, the connection between findings and recommended actions for future marketing and service planning initiatives has not been documented. In addition, no protocols have been established for trend or market segment analysis.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, or milestones for annual surveys.

Auditor Recommendations

In order to use the survey results to implement improvements, it will be necessary to further develop the connection between information, analyses, and programmatic action. Additionally, the Definition of Measurement should be amended to remove the statement "and hold focus-group meetings" unless focus groups will actually be conducted.

5d. *Improvements in public information regarding vehicle delays during operations as well as any general user information regarding system modifications, route changes, and schedules.*

Goal:	Improve Passenger Information.
Purpose:	Improve all aspects of public information.
Definition of Measurement:	Improve passenger information by communication of service problems and other information to each vehicle, the station platforms, the Telephone information Center, media, and the Service Hotline
Method of Measurement:	Results of Rider Surveys will indicate success.
Milestones:	Rider Survey feedback. (Not reported in FY2001 or FY2002.)

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance During the Audit Period

This standard was not included in the Service Standards reports in FY2001 or FY2002.

Verification of Definition and Method of Measurement During the Audit Period

Muni did not report results in this area in either FY2001 or FY2002. In fact, there are no specific questions on the passenger satisfaction survey that deal with customer information. However, during the audit period, there were a number of important changes to the customer information and public relations functions at Muni that support this goal:

- Several different functions have been combined under an umbrella group responsible for Community and Public Relations.
- This department has developed a "service quality" approach that puts Muni staff on site at locations where there are either significant changes in service or unanticipated service delays or disruptions to provide information and assist passengers.
- The Community and Public Relations department is integrated into the capital projects team for any capital project that is likely to cause rider and neighborhood disruptions. The Community and Public Relations staffs both provide advice to the project delivery team and take lead responsibility for notifications to the riders and the larger public that may be affected by a Muni project.
- Muni substantially upgraded its website and provides high quality information regarding service changes, schedule updates and disruptions.
- During the audit period, Muni printed and distributed schedule books for all lines operated by the railway in paper format, as well as providing telephone and electronic information.
- The Next Bus system was installed in the subway, providing real time information for subway riders. In addition, a pilot Next Bus program was implemented on one bus route, and is planned to be expanded to the rest of the bus system, pending funding.
- Automatic stop announcements on new vehicles provide useful, new information to passengers on board Muni vehicles.

While Muni has clearly made important strides in the area of community and public relations, it has yet to adopt a definition and method of measurement that can adequately describe these activities. Staff proposes the following changes for the 2003-04 fiscal year.

Verification of Reported Performance During the Audit Period

Reported performance could not be verified since this standard was not included in performance reports in FY2001 or FY2002.

Problems or Issues Identified During the Audit Period

One of the reasons this service standard has not been reported on to date may be the complexity of the measure itself. The measure "improvements in public information regarding vehicle delays during operations as well as general user information regarding system modifications route changes and schedules" combines two very different types of information – real time information that is necessary for customers to understand and respond to immediate changes and disruptions in the system and information with a longer lead time, for construction projects, schedule and service changes, etc. These two distinct types of information are generally not handled by the same people or the same departments, which has made measuring this information difficult.

Muni has made significant progress towards improving customer information, both for real time and longer lead-time information needs. Significant efforts have been made to develop a clear chain of command for handling information at the scene of a major delay or service disruption. Muni's intent to develop a public information plan that covers all of these potential information needs should be encouraged. This plan could be written in the format of a "disaster recovery plan" – identifying all of the steps required to provide information under a variety of circumstances and who is responsible for managing that aspect of public relations. In a well-developed plan, some responsibilities will lie with operations, central control, the phone room, and community relations service teams. Other responsibilities will belong to project teams working on route changes and capital projects.

While Muni has made substantial progress in improving customer information, it has not developed methods for evaluating the impact of its information on customers. For example, when there is a major service disruption that requires Service Quality team involvement, there is no follow-up with passengers to see if they were satisfied by the information they received. Similarly, in neighborhoods where construction occurs, Muni has worked diligently to improve outreach, but there is no feedback loop to determine whether information was received in a timely manner, and whether it was helpful to riders.

Adopted FY2004 Revision

Goal:	Improve Passenger Information.
Purpose:	Improve passenger information by communication of service problems and other information to each vehicle, the station platforms, the Telephone Information Center, media and the Service Hotline, and assess.
Definition of Measurement:	Assess current practices, develop and implement improvement plan.
Method of Measurement:	Plan completed and implemented.
Milestones:	Plan completed and implemented.

From *Muni Service Standards Report, 1st Quarter FY2004*

Action Plan

To be truly useful, this standard should be divided into two goals to distinguish between routine information provided in real time and longer-term information provided as part of service or schedule change and/or construction projects.

The steps taken to modify this goal in 2004 are a good first step towards refining this measure. Muni is encouraged to complete its information plan, providing clear direction as to what information needs to be provided and who is responsible under a variety of circumstances. This includes identifying a lead person for information provided on site, as well as leads for individual tasks. These people should not be named, as individuals change from time to time, but by position or department. Consideration should be given to providing information in accessible media and alternative language formats, as Muni serves a diverse customer base.

Muni is further encouraged to develop a method of assessing the impact of their information on the riding public and the neighborhood or community impacted by their information campaigns. This could come in the form of a simple survey, implemented by Service Quality teams following incidents or events where public information has been provided.

To further differentiate between immediate information provided to passengers on the system during delays or other unusual events, and longer-term information provided to address construction or other longer-term events the following systems of measurement are recommended:

Goal:	Improve Real-Time Passenger Information regarding service delays.
Purpose:	Provide the public with information regarding service delays that will enable them to make choices about their trip.
Definition of Measurement:	Improve passenger information by communication of service problems and other information to each vehicle, the station platforms, the Telephone information Center, media, the Service Hotline, and Service Quality Teams.Operators will make passenger announcements in all cases where service delays exceed 3 minutes in the subway and 10 minutes on surface lines. Central Control will make both visual and verbal announcements in all stations where service delays exceed 3 minutes on all LRV lines.Service Quality Teams will be assigned to all unscheduled service disruptions exceeding two hours.
Method of Measurement:	Central Control logs.Passenger Satisfaction Surveys.
Milestones:	Plan completed and implemented.

6d. *Efforts to improve driver training, technical as well as accident follow-up.*

Goal:	100,000 hours of Driver Training per year and 5% reduction in accidents.
Purpose:	Reduce accidents through effective operator training programs as well as effective accident follow-up training.
Definition of Measurement:	Monthly measurement of the number of training hours by type of class. Track reduction in accidents as a result of more effective operator training and accident retraining. Training hours will be tracked for the following areas: • New Operator Training • Immediate Follow-up Rides • One Day Accident Retraining • Two Day Accident Retraining • Verification of Transit Training • Operator Refresher • Passenger Relations/Conflict Training
Method of Measurement:	Number of FTA reportable accidents and training hours. Data will be reported to the board on a quarterly basis.
Milestones:	100,000 hours of Driver Training and 5% accident reduction.

From *Muni Service Standards Report, FY 2001 and FY2002*

Reported Performance

There were a total of 140,692 and 129,769 operator training hours in FY2001 and FY2002, respectively, exceeding the goal of 100,000 annual hours of driver training. In FY2003, the goal of 50,000 training hours was also exceeded. Table D-3 summarizes this information. As shown in Table D-4, a 5% reduction in accidents was not achieved in either FY2001 or FY2002. This trend appears to be continuing based on FY2003 and first quarter FY2004 data.

Table D-3 Operator Training Hours, FY2001 – FY2004

	FY2001		FY2002		FY2003		1st Quarter 2004	
	Actual	Goal	Actual	Goal	Actual	Goal	Actual	FYTD Goal
Total Operator Training Hours	140,692	100,000	129,769	100,000	*82,099*	*50,000*	*24,252*	*50,000*

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*
Data in Italics have not been audited.

Table D-4 Number of Accidents, FY2001 – FY2004

	FY2001		FY2002		FY2003		1st Quarter 2004	
	Actual	Goal	Actual	Goal	Actual	Goal	Actual	FYTD Goal
Number of Accidents	3,043	2,880	2,913	2,891	*2,966*	*2,767*	*711*	*704*

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*
Data in Italics have not been audited.

Table D-5 Accidents per 100,000 Operator Pay Hours Worked, FY2001 – FY2003

	FY2001			FY2002				FY2003			
	Operator Pay Hrs Worked	# of accidents	Rate	Operator Pay Hrs Worked	# of accidents	Rate	% change	Operator Pay Hrs Worked	# of accidents	Rate	% change
Cable car	271,376	116	42.7	292,654	92	31.4	-26.5%	*125,495*	*89*	*70.9*	*125.8%*
Green	477,221	424	88.8	478,227	340	71.1	-19.9%	*583,010*	*312*	*53.5*	*-24.8%*
Flynn	388,118	458	118.0	410,038	417	101.7	-13.8%	*369,460*	*389*	*105.3*	*3.5%*
Kirkland	502,677	422	83.9	583,531	439	75.2	10.4%	*499,378*	*407*	*81.5*	*8.4%*
Potrero	562,122	655	116.5	614,385	647	105.3	-9.6%	*588,623*	*682*	*115.9*	*10.1%*
Presidio	470,249	401	85.2	504,511	435	86.2	1.2%	*483,517*	*455*	*94.1*	*9.2%*
Woods	705,383	567	80.3	774,054	543	70.2	-12.6%	*675,629*	*632*	*93.5*	*33.2%*
Systemwide	**3,377,146**	**3,043**	**90.1**	**3,657,400**	**2,913**	**79.6**	**-11.7%**	***3,325,112***	***2,966***	***89.2***	***12.1%***

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003

Data in italics have not been audited.

In addition to the number of operator training hours and the total number of accidents, Muni also reported the number of accidents per 100,000 operator pay hours worked for each division. In FY2001, the system-wide accident rate per 100,000 paid operator hours worked decreased by 4.8% from 94.7 in FY2000, to 90.1 in FY2001. Between FY2001 and FY2002, the system-wide accident rate decreased by 11.7% from 90.1 to 79.6. However, according to unaudited FY2003 data, the systemwide accident rate increased by 12.1% between FY2002 and FY2003. Table D-5 summarizes this information

Verification of Definition and Method of Measurement During the Audit Period

The method of measurement states that only FTA reportable accidents should be tabulated. In fact, all accidents were counted in fiscal years 2001 and 2002. (FTA reportable accidents are those accidents that result in a significant level of property damage, injuries requiring medical attention away from the scene, or fatalities.)

All other information was collected according to the described definition and method of measurement. The number of training hours was calculated based on the number of individuals who completed a particular training session multiplied by the length (in hours) of the training session. One- and two-day accident retraining was not reported separately; instead, the number of hours for one- and two-day training were combined and the total number of accident retraining hours was reported.

As of July 1, 2002, all accident data was tracked using the Transit Safe Database. Accident information was entered directly into the database by transit operators and investigating supervisors. Prior to this time, accident reports were filed in hard copy and were then entered into the old BMIS mainframe database.

Verification of Reported Performance During the Audit Period

An audit of operator training data for the first quarter of FY2002 showed that data were reported correctly for this period, with the exception of Violence in the Workplace training. Violence in the Workplace training hours were double counted since they were counted as part of New Operator Training and were then counted again separately. Thus, the total number of operator training hours for FY2001 should be 138,642, and should be 129,038 for FY2002.

Data for the number of accidents and the accident rate per 100,000 operator pay hours worked were verified for fiscal years 2000, 2001 and 2002. Source data for operator training hours, accidents, and operator pay hours worked consisted of summary spreadsheets that had been compiled by staff at the time the Service Standards Reports were being written.

Problems or Issues Identified During the Audit Period

All accidents were reported in FY2001 and FY2002, not just those that were reportable under FTA guidelines. Muni has already changed the method of measurement for this indicator to include all accidents, not just those that are FTA reportable.

Violence in the Workplace training hours were double counted in both fiscal years 2001 and 2002. Violence in the Workplace training hours were counted as part of New Operator Training and were then counted again separately. Thus, the total number of operator training hours for FY2001 should be 138,642 and should be 129,038 for FY2002.

The reporting of accident rates as calculated per 100,000 operator pay hours worked is not a standard measurement in the industry. The transit industry standard is to report accident rates per miles driven, hours of service provided, or period of time. Furthermore, according to the MOU between Muni and the Transit Workers Union, operator incentives are dependent on the "reduction in the total number of accidents for all categories of revenue accidents," not a reduction in the accident rate per 100,000 operator pay hours worked. Thus, there is no clear reason as to why the accident rate should be reported in a manner that is inconsistent with industry standards.

In both FY2001 and FY2002, Muni failed to achieve its goal of a 5% reduction in the number of accidents. This trend appears to be continuing in FY2003.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has adjusted the milestone for training and accidents as follows:

- FY2003 and FY2004 – 50,000 hours/5% Accident Reduction
- FY2004 Method of Measurement was amended to:"Number of reportable accidents and training hours. Data will be reported to the board on a quarterly basis."

Action Plan

The following are relatively minor issues that should be addressed:

- Violence in the Workplace training hours should not be double counted in reports of operator training hours.
- Ensure that the definition of measurement accurately describes the types of accidents being reported.
- Consider reporting the accident rate in a manner consistent with transit industry standards, such as accidents per miles driven, hours or service provided or over a given period of time. Differentiate between vehicle accidents (collisions) and customer accidents (e.g., slips and falls). Table D-6 shows the systemwide accident rate per 100,000 revenue miles for fiscal years 2001, 2002 and 2003.

Table D-6 Accidents per 100,000 Revenue Miles, FY2001 – FY2003

Systemwide Performance	FY2001	FY2002	FY2003
Revenue Miles	24,735,581	26,613,598	*28,767,205*
Number of Accidents	3,043	2,913	*2,966*
Accident Rate per 100,000 Revenue Miles	12.30	10.95	*10.31*

From Muni Service Standards Report,4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004
Data in italics have not been audited

Achieving Goals for Accident Reduction

According to the Office of Health and Safety Manager, hours of driver training are not having a direct impact on accident numbers and rates. In fact, Muni has an excellent driver training program that conforms to all national and state guidelines and standards. Rather than focus on driver training, a comprehensive approach and coordinated effort to reduce accidents across divisions and departments is needed. In order to reduce the number of accidents, safety needs to be made the top priority throughout the system, above all other goals and objectives. A solid culture of safety needs to be established before other performance goals can be accomplished, otherwise Muni will continue to be unable to achieve its goals with regard to accident reduction.

There are three key elements to reducing accidents:

- Engineering improvements (i.e., remove safety problems through engineering and technical improvements);
- Employing warning devices and instituting safety rules and procedures, including safety training; and
- Enforcing safety rules and procedures.

Interviews with staff indicate that Muni is doing well with regard to the first two elements, but has failed with regard to strict enforcement of safety rules and procedures and in creating an organizational culture that makes safety the top priority. Work has already begun on addressing these issues, and the auditor recommends that this continue to be a focus for both management and transit operators.

The number of accidents and accident rate is closely related to problems with on-time performance and headway adherence. The fact that a significant number of lines are running early/sharp may mean that drivers are speeding, or driving in other ways that compromise safety. More street inspectors are needed to enforce on-time performance. Run times and schedules may need to be reevaluated to ensure that drivers can complete their routes both safely and on time.

7d. Number of crime incidents on Municipal Railway vehicles or in Municipal Railway facilities.

Goal:	Reduction of 5% from previous year.
Purpose:	To measure the crime rate on transit vehicles.
Definition of Measurement:	Quarterly, we report on all categories of crime incidents with the corresponding quarter for the previous year with a % change.
Method of Measurement:	Data is collected by the Muni Transit Police. Data will be reported to the board on a quarterly basis.
Milestones:	5%

From *Muni Service Standards Report, FY 2001 and FY2002*

Reported Performance

The number of reported crime incidents includes all incidents that occurred on Muni vehicles or property. Table D-7 summarizes reported performance in FY2001, FY2002, FY2003 and the first quarter of FY2004 with regard to crime incidents. While Muni failed to meet its goal in FY2001, it exceeded its FY2002 goal with a reduction of an additional 126 incidents. The FY2003 goal was also exceeded by the reduction of an additional 121 incidents.

Table D-7 Number of Reported Crime Incidents, FY2001 – FY2004

	FY2001		FY2002		FY2003		1st Quarter FY2004
	Actual	Goal	Actual	Goal	Actual	Goal	Actual
Number of incidents	2,927	2,340	2,655	2,781	*2,401*	*2,522*	*554*

From *Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004*
Data in Italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

Incident data was tracked by both Muni's Security Department and by the San Francisco Police Department (SFPD). Incident reports were generated by Muni Central Control, Passenger Services and the SFPD. Those generated by Central Control and Passenger Services were logged into the Transit Safe database by Muni staff.

The SFPD not only tracks police reports, but also receives copies of incident reports from Muni. The SFPD maintained its own incident database, and provided copies on a regular basis to Muni staff so that SFPD information could be entered into Transit Safe. Muni staff also double checked their incident records against those of the SFPD to make sure all information was consistent. (Beginning in 2004, the SFPD will enter incident information directly into the Transit Safe database.)

Verification of Reported Performance During the Audit Period

An audit of data for FY2002 found that data appeared to be correctly reported for the first, third and fourth quarters of the fiscal year. However, there were slight data discrepancies for the second quarter. Staff stated that this discrepancy was likely due to the fact that some additional incident reports came in and were added to their tracking spreadsheet after the incident data was submitted for publishing in the Service Standards Report.

	2nd Quarter FY02	
	Reported	Actual
Number of Incidents	676	688

More significant is the fact that fare citations issued by Muni fare inspectors were not included in the FY2001 and FY2002 incident reports. According to the Security Department, only fare citations issued by the SFPD were counted. The following table shows the number of fare citations issued by Muni fare inspectors in FY2001 and FY2002. A total of 4,146 and 3,660 fare citations were given in FY2001 and FY2002, respectively. In comparison, only 66 and 16 fare evasion incidents were reported in the FY2001 and FY2002 Service Standards Reports, respectively.

Table D-8 Number of Fare Citations Issued by Muni Fare Inspectors

	FY2001	FY2002
1st Quarter	926	726
2nd Quarter	828	713
3rd Quarter	1,522	863
4th Quarter	870	1,358
TOTAL	4,146	3,660

Problems or Issues Identified During the Audit Period

Fare evasion citations issued by Muni fare inspectors were not included in the FY2001 and FY2002 Service Standards Reports. Including this data increases the number of reported incidents significantly, but does not affect the achievement of a 5% reduction in incidents for FY2002. (With the addition of fare citations, the total number of incidents in FY2001 was 7,073 and was 6,315 in FY2002. This represents a 10.7% reduction in incidents from FY2001 to FY2002.)

The SFPD's maintenance of a separate incident database has made it more time consuming and labor intensive for Muni staff to generate incident reports. This issue should be resolved in 2004 when the SFPD will begin entering information directly into the Transit Safe database as well.

While Transit Safe allows staff to track details about all incidents, it cannot automatically generate some of the necessary reports. For example, total incidents can only be tabulated for each division, rather than for the system as a whole. Additionally, the database cannot generate reports about the total number of assaults or arrests. To tabulate this information, staff must look up each individual case to determine whether or not it was an assault or arrest.

Coding of incidents is not standardized across all Muni departments. This sometimes leads to inadequate or inaccurate information on incident reports.

Changes In Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes to the definition of measurement, method of measurement, nor the milestones.

Auditor Recommendations

Fare evasion citations issued by Muni fare inspectors should be included in the incident reports included in the Service Standard Reports.

A consistent method of coding crime incidents should be developed and used by all departments responsible for collecting this information. Additionally, new queries should be developed within Transit Safe to streamline and automate the reporting of crime incident data.

The indicator purpose included in the Service Standard Report should be amended to, "To measure the crime rate on transit vehicles and facilities." This more accurately reflects both the content and purpose of the indicator.

E. *Employee Satisfaction*

Employee satisfaction not only affects staffing performance, but also affects customer service and overall system performance as well, since dissatisfied employees are less likely to provide the best service possible. Consequently, Proposition E included the following service standards aimed at measuring employee satisfaction:

- 1e. Number of grievances.
- 2e. Speed of resolution of grievances.
- 3e. Longevity of employment.
- 4e. Employee recognition.
- 5e. Employee education and training opportunities.

Key Recommendations

The following are key recommendations based on the findings of our audit of FY2001 and FY2002 Service Standards data and on trends observed in unaudited FY2003 and FY2004 Service Standards data:

- In addition to the service standards listed above, Muni is also measuring employee satisfaction via its annual Employee Survey. The results of this survey should be incorporated into this group of service standards since, in many respects, it provides a better measure of employee satisfaction than the current group of service standards.
- For Service Standard 1e, a goal or benchmark for the number and type of grievances should be established so that management can more effectively monitor changes in grievance rates.
- For Service Standard 2e, the method for reporting speed of resolution of grievances for non-operator grievances needs to be closely examined and monitored to ensure that information is reported correctly in the future.
- Service Standard 3e provides almost no information about employee satisfaction. If anything, it is more a measure of staffing performance, since long-term employees (and relatively minimal staff turnover) reduce the need to hire and train new employees. The auditor therefore recommends that this measure be eliminated from the Service Standards Report, or, if retained, moved to the Staffing Performance section.
- For Service Standard 4e, the actual number and type of annual and quarterly awards made should be included in the Service Standards Report.
- For Service Standard 5e, all employee training hours should be tracked in some type of centralized system in order to facilitate future reports and audits.

1e. Number of grievances.

Goal:	Report quarterly on the number of grievances.
Purpose:	Record and monitor the status of all grievances.
Definition of Measurement:	Quarterly reports will include number of new grievances filed, resolved and active, by division.
Method of Measurement:	Internal tracking system will be used to provide data for the board on a quarterly basis.
Milestones:	Quarterly grievance report.

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

This standard measures grievances filed by Muni employees and may include a wide range of employee complaints. In FY2001, and the first quarter of FY2002, only transit operator grievances were tracked, while operator maintenance and other employee grievances were monitored for the last three quarters of FY2002. Significantly fewer operator grievances were filed in FY2003. Tables E-1 and E-2summarize the number of grievances received and resolved during the fiscal year, as well as those that remained active at the year's end. At the beginning of FY2001, there was a backlog of over 300 grievances that were resolved over the course of the fiscal year.

Table E-1 Operator Grievances, FY2001 – FY2004

Grievance Status	FY2001 Total	FY2002 Total	FY2003 Total	1st Q 2004
Received	93	117	*60*	*7*
Resolved	409	124	*62*	*7*
Active	9	2	*0*	*0*

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004
Data in italics have not been audited.

Table E-2 Maintenance and Miscellaneous Employee Grievances, FY2001 – FY2004

Grievance Status	FY2002 Total	FY2003 Total	1st Q 2004
Received	17	14	1
Resolved	13	16	1
Active	4	2	2 (from prev. FY)

From Muni Service Standards Report, 4th Quarter FY2001, FY2002, FY2003 and 1st Quarter FY2004
Data in italics have not been audited.

Verification of Definition and Method of Measurement During the Audit Period

The Human Resources Department tracked grievances on a quarterly basis. All data was collected and reported according to the definition and method of measurement. The only exception was that grievances were not reported for each division; instead, the total number of operator and non-operator grievances were reported.

Verification of Reported Performance During the Audit Period

Based on an audit of fourth quarter FY2002 data for the number of maintenance and miscellaneous employee grievances, and FY2002 quarterly data for operator grievances, data appear to have been collected and reported accurately.

FY2001 operator grievance data could not be verified due to the fact that the original grievance reports no longer exist. The auditor did verify that the backlog of grievances had been resolved by the end of FY2001.

Problems or Issues Identified During the Audit Period

Grievances were not reported by division, as described in the definition of measurement.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes in the definition of measurement, method of measurement, nor milestones.

Auditor Recommendations

Either the definition of measurement should be amended so that it no longer states that grievances will be tracked by division, or the number of grievances for each division should be reported separately. Additionally, no goal has been established for the number or type of grievances that are filed, and it is thus difficult to use this measure as an indication of employee satisfaction. The auditor recommends that a goal or benchmark for the number and type of grievances be established so that management can more effectively monitor changes in grievance rates.

2e. *Speed of resolution of grievances.*

Goal:	Resolve 75% of internal grievances within 30 days.
Purpose:	Measure the effectiveness of the Labor Relations in the resolution of grievances.
Definition of Measurement:	Monthly measurement of the resolution of grievances.
Method of Measurement:	Internal tracking system will be used to provide data for the board on a quarterly basis.
Milestones:	Resolution of 75% of grievances within 30 days.

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

This standard measures the speed with which employee grievances are resolved. In FY2001 and the first quarter of FY2002, only transit operator grievances were tracked, while both operator and maintenance and other employee grievances were monitored for the last three quarters of FY2002. However, due to the backlog of over 300 grievances at the beginning of FY2001, speed of resolution of grievances were not recorded for the first, second and third quarters. Alternatively, the Service Standards Reports described the steps that had been taken to speed the resolution of grievances during the first, second and third quarters of FY2001.

For all quarters in which data were reported, 75% or more of operator grievances were resolved within 30 days. For maintenance/miscellaneous employees, 100% of grievances were resolved within 30 days during the second quarter of FY2002, while 0% and 30% were resolved within 30 days for the third and fourth quarters of FY2002, respectively. In the fourth quarter of FY2003, 97.5% of operator grievances were resolved within 30 days, while only 33% of maintenance/miscellaneous employee grievances were resolved within 30 days.

Verification of Definition and Method of Measurement During the Audit Period

The timeline for Human Resources' grievance tracking begins when an operator grievance reaches Step 3, and when a maintenance/miscellaneous employee grievance reaches Step 2. Grievances were assigned a number, and major actions and associated dates were logged by Human Resources staff.

The time spent to resolve operator grievances was based on when a Step 3 decision was issued. When time was waived by mutual consent of either party, the "clock was stopped" and the waived time was not counted. Non-operator grievances were only considered to be resolved if they were resolved at the Step 2 level. These timelines are based on the fact that grievances that progress beyond the Step 3 (for operators) or Step 2 levels (for non-operators) are no longer the primary responsibility of the Muni Human Resources Department.

Verification of Reported Performance During the Audit Period

An audit of operator grievance data for FY2002 verified that all data was collected and reported correctly. Non-operator data for FY02 could not be verified. Human Resources staff stated that they did not report speed of resolution information for FY2002 and did not know how the data were generated.

Problems or Issues Identified During the Audit Period

Data on the speed of resolution of grievances for non-operators could not be verified. It is unclear as to how this information was measured.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes in the definition of measurement, method of measurement, nor milestones.

Auditor Recommendations

The method for reporting speed of resolution of grievances for non-operator grievances needs to be closely examined and monitored to ensure that information is reported correctly in the future. For FY2002, this information appears to have been reported incorrectly.

3e. *Longevity of employment.*

Goal:	Provide an annual report of the longevity of employment.
Purpose:	Track and report on the longevity of employment.
Definition of Measurement:	Monthly tracking of the number of employees that leave through retirements, terminations and promotions.
Method of Measurement:	Produce an annual report that shows the longevity of employment by classification, including Years of Service.
Milestones:	Annual longevity of employment report.

From *Muni Service Standards Report, FY 2001 and FY2002*

Reported Performance During the Audit Period

There was a significant jump in longevity of employment for nearly all job categories between FY2001 and FY2002. This was due to the fact that only years of service with Muni were counted in FY2001, and that years of service with the City of San Francisco were counted for FY2002 (and all subsequent fiscal years). It should be noted that certain job classes that are associated only with transit operations are Muni-specific, and longevity thus reflects only years of service with Muni. Table E-3 summarizes employee longevity for these two years.

Table E-3 Employee Longevity, FY2001 – FY2002

Job Category	FY2001	FY2002
Office/Clerical	1.83 years	11.52 years
Officials and Administrators	1.33 years	14.81 years
Paraprofessionals	0.73 years	1.00 years
Professionals	2.66 years	6.50 years
Protective Service	0.58 years	5.98 years
Service Maintenance	8.59 years	10.64 years*
Transit Operators	10.82 years	–
Skilled Craft	6.62 years	12.99 years
Technicians	1.99 years	7.93 years

From *Muni Service Standards Report, 4th Quarter FY2001 and FY2002*

*Includes both service maintenance and transit operators for FY2002

Verification of Definition and Method of Measurement During the Audit Period

The Position Control System (PCS) database was used to track all Muni personnel data, including changes in appointment, temporary and permanent separations (by type), etc. The PCS database was used to generate a report on the average years of Muni service in each job class and category.

Verification of Reported Performance During the Audit Period

Based on an audit of FY2001 and FY2002 data, all data on employee longevity appears to have been reported accurately.

Problems or Issues Identified During the Audit Period

Only years of service with Muni were reported in FY2001, while total years of service with the City of San Francisco were reported for all non-Muni specific job categories in FY2002.

Changes In Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes in the definition of measurement, method of measurement, nor milestones.

Auditor Recommendations

The Service Standards Reports show "Average Years of Muni Service." This statement is incorrect, since the longevity report actually shows average years of service with the City of San Francisco for all job categories that are not Muni-specific (e.g., Transit Operators). Either this label should be changed to accurately reflect the information that is reported, or only years of Muni service should be calculated and reported.

This Service Standard provides almost no information about employee satisfaction. If anything, it is more a measure of staffing performance, since long-term employees (and relatively minimal staff turnover) reduce the need to hire and train new employees. The auditor therefore recommends that this measure be eliminated from the Service Standards Report, or, if retained, moved to the Staffing Performance section.

4e. Employee recognition.

Goal:	Annual achievement of honorees in the following programs: • (12) Systemwide Operators of the Month Award • (4) Transit Supervisor's of the Quarter Award • (4) Finance & Admin Employee's of the Quarter • (12) Maintenance Employees of the Month • (4) Maintenance Supervisors of the Quarter • (4) Safety & Training Employee of the Quarter • (4) Accessibility Employee of the Quarter
Purpose:	To recognize the achievements of employees and encourage excellence in job performance.
Definition of Measurement:	Monthly tracking of all award programs. Award program criteria vary for the above. A detailed nomination evaluation process exists on file for each program. Criteria for non-operator awards includes, but is not limited to employee's performance evaluation, attendance, work performance, absence of disciplinary and or EEO measures. For Operator awards, attendance records, accident records, PSR's and safety records are used to evaluate the candidate.
Method of Measurement:	A detailed nomination evaluation process exists on file for each program and the time frame measured is generally on a rolling 12 month basis. Some of the criteria includes employee's performance evaluation, attendance, work performance, absence of disciplinary and or EEO measures. Data will be reported to the board on a quarterly basis.
Milestones:	Annual achievement.

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

There was no reported performance for this indicator in either the FY2001 or FY2002 Service Standards Reports.

Verification of Definition and Method of Measurement During the Audit Period

The definition and method of measurement could not be verified.

Verification of Reported Performance During the Audit Period

The following awards were made during calendar year 2001:

- (10) Systemwide Operators of the Month Award
- (2) Transit Supervisor's of the Quarter Award
- (3) Finance & Admin Employee's of the Quarter
- (15) Maintenance Employees of the Month
- (0) Maintenance Supervisors of the Quarter
- (2) Safety & Training Employee of the Quarter
- (0) Accessibility Employee of the Quarter

Additional awards were made for Construction Division Employees of the Quarter (2), Capital Planning and Legislative Affairs Division Employee of the Quarter (3), and Human Resources, Labor Relations, and EEO Division Employee of the Quarter (3).

All honorees received formal recognition at an awards banquet, gift certificates, and were eligible to win major prizes. All those nominated for awards were recognized as well.

Problems or Issues Identified During the Audit Period

The Service Standards Reports did not report on the actual number and type of awards made during each fiscal year, although some of the goals were met.

Changes in Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes in the definition of measurement, method of measurement, nor milestones.

Auditor Recommendations

The actual number and type of annual and quarterly awards made should be included in the Service Standards Report.

5e. Employee education and training opportunities.

Goal:	Provide 50,000 annual hours of employee training or approximately 20 hours per FTE.
Purpose:	Provide continuous opportunities for employee development
Definition of Measurement:	Training hours will be tracked monthly for the following areas: • Maintenance Training (including new revenue vehicle training) • 7 Habits of Highly Effective People • Ambassador Training • Supervisory Skills Training • Management Skills Training • Violence in the Workplace • Desktop Computer Training • Additional training as developed
Method of Measurement:	Track number of hours by type of training. Data will be reported to the board on a quarterly basis.
Milestones:	50,000 annual hours training and education

From Muni Service Standards Report, FY 2001 and FY2002

Reported Performance

This standard measures training hours for non-operator staff. In FY2001, 53,296 hours of training were provided, and 50,880 hours of training were provided in FY2002. In FY2003, 31,241 hours of training were provided (less than the goal of 50,000 annual training hours); and 7,169 hours were offered in the first quarter of FY2004. Training was provided in all of the categories outlined in the definition of measurement with the exception of the "7 Habits of Highly Effective People" training which was not provided in FY2002 and FY2003.

Verification of Definition and Method of Measurement During the Audit Period

Maintenance and administrative training were tracked in a number of ways. Administrative training includes regular in-house training sessions as well as conferences, retreats, and seminars attended by staff members.

For in-house training, the number of people who completed each class was recorded and the total number of training hours was computed by multiplying the number of attendees by the number of class hours. For external conferences, seminars, etc., staff members who attended these events were asked to report the number of hours spent at each event.

Verification of Reported Performance During the Audit Period

An audit of FY2002 reported training hours for Violence in the Workplace training found that the number of training hours was correctly reported for all quarters except for the fourth. For the fourth quarter of FY2002, there were 261 training hours reported in the Service Standards Report. Data collected by the Training Manager showed that 345 training hours were administered during the fourth quarter of FY2002.

An audit of FY2002 third and fourth quarter reported training hours for Drug and Alcohol training verified that supervisor Drug and Alcohol training hours were reported correctly for both quarters, and employee Drug and Alcohol training was reported correctly for the fourth quarter. For the third quarter, a total of 264 employee Drug and Alcohol training hours were reported. However, according to the Training Supervisor, 316 hours of employee Drug and Alcohol training were administered during the third quarter of FY2002.

Class logs were provided for Maintenance Training for FY2001 and FY2002, however not enough information was provided to derive the reported number of hours of Maintenance Training included in the Service Standards Reports. For other types of training hours, records were incomplete or nonexistent and the reported performance could not be verified.

Problems or Issues Identified During the Audit Period

No significant issues or problems were identified. However, some type of centralized database or record keeping system that could be used to keep track of all training hours would facilitate future reporting and audits.

Changes In Measurement Since the Audit Period

Subsequent to the audit period, Muni has made no changes in the definition of measurement, method of measurement, nor milestones.

Auditor Recommendations

All employee training hours should be tracked in some type of centralized system in order to facilitate future reports and audits.

Conclusion

Table F-1 summarizes recommendations for each service standard.

Table F-1: Summary of Auditor Recommendations

Service Standard	Recommendations
A. SYSTEM RELIABILITY	
1a. % of vehicles that run on time according to published schedules.	·Reduce incidence of early/sharp operations.·Schedule evaluation/remediation to improve on-time performance.·Route evaluation to improve on-time performance.·Targeted improvements directed at specific, under-performing lines.·Reallocation of terminal checking to increased NTD checking (after improvement of early/sharp operation is achieved).·Measure schedule adherence only for those transit services with headway intervals of more than 10 min.·Coordinate 1a goal with other goals and objectives, particularly those for 2a, 6a and 6d.·Consider using cumulative, annual performance to measure annual achievement of goals.
2a. % of scheduled service hours that are delivered and % of scheduled vehicles that begin service at the scheduled time.	·Develop a plan for maximizing service provision during "low availability periods."·Consider using cumulative, annual performance to measure annual achievement of goals.
3a. Missed service due to either insufficient vehicles or driver unavailability as a percentage of scheduled service hours.	·Eliminate this service standard since it is simply an inverse of 2a.
4a. % of vehicles that pass published time points during measurement periods unable to pick up passengers due to crowding without being followed within 3 minutes or less by another vehicle on the same route with space for all waiting passengers.	·Include a systemwide pass-up table by quarter with both number and %; show previous quarters and present an annual summary.·Track individual pass-up line performance over each quarter of each fiscal year.·Coordinate with 5a so that all lines identified as exceeding 85% capacity during peak periods are monitored as part of 4a. ·Additional data available through the Passenger Service Reports database should be used to conduct follow-up traffic checks on lines chronically identified as having pass-ups or peak period loads exceeding 85% of capacity.
5a. Peak period passenger load factors.	·For noncompliant lines, sampling frequency should be increased until performance improves.·May be more meaningful to capture individual line load factors by 15 min periods rather than a for a full hour.·Present both a quarterly and an annual performance summary.·Coordinate with 4a so that all lines identified as exceeding 85% capacity during peak periods are monitored as part of 4a. ·Additional data available through the Passenger Service Reports database should be used to conduct follow-up traffic checks on lines chronically identified as having pass-ups or peak period loads exceeding 85% of capacity.

Service Standard	Recommendations
6a. Actual headways against scheduled headways on all radial, express, cross-town, secondary and feeder lines for peak, base, evening and late night services.	·Measure headway adherence only for those transit services with headway intervals of 10 min or less.·Schedule evaluation/remediation to improve headway adherence.·Route evaluation to improve headway adherence.·Reallocation of terminal checking to increased NTD checking (after improvement of early/sharp operation in achieved).·Coordinate 6a goal with other goals and objectives, particularly those for 1a, 2a and 6d.·Consider using cumulative, annual performance to measure annual achievement of goals.
7a. % vehicle availability and reliability (mean distance between failure) by mode.	·Consider using cumulative, annual performance to measure annual achievement of goals.·Consider reporting information on spare ratios to determine underlying causes of vehicle availability problems.·Correct definition of measurement to remove the statement, "An additional measurement is added which shows the number of days when a facility (mode) does not have 100% availability," or include this information in the Service Standards Report.
8a. Unscheduled absences by operator, mechanical and administrative personnel.	·Consider establishing a more reasonable goal for the % of unscheduled absences in the Administration Division.
9a. Miles between roadcalls by mode.	·Calculate quarterly MDBF in a consistent manner.·Consider using cumulative, annual performance to measure annual achievement of goals.
B. SYSTEM PERFORMANCE	
1b. Passengers carried by mode.	·Remove "Data will be reported to the board on a quarterly basis" from the Definition of Measurement.·Realistic goals for ridership should be established based on economic conditions as well as available services.
2b. Fare revenues generated by mode.	·Calculate average fare per passenger.·Change milestone to: "Fare revenue should increase by 1.5% per year compared with prior year performance."
3b. Hours and miles operated by mode.	·Miles and hours of service are a direct reflection of available budget; consider eliminating this service standard (data will still be reported for NTD purposes).
4b. Expenses incurred by mode.	·Revise the performance measurement system to track fully allocated costs per hour of service by mode.
C. STAFFING PERFORMANCE	
1c. Net vacancies by position (vacancies remaining once promotions and new hires have been deducted from retirees or resignations) for each division.	·Limit measurement to Transit Operators and Maintenance personnel.

Service Standard	Recommendations
2c. Attrition rates for new employees, by division and level.	·Data do not provide information on the attrition rates for new employees. To calculate attrition, only those employees who separate after six months or one year of service should be counted. ·If possible, use available information to report on reasons for voluntary separations.
D. CUSTOMER SERVICE	
1d. Development of annual marketing plan identifying specific programs and projects that will promote increased patronage.	·Set priorities for marketing efforts.·Utilize data from ridership surveys to evaluate success.
2d. Publication and distribution to the public of schedules for all trips taken by all vehicles that shall consist of specific arrival times at terminals and established intermediate points.	·Fully utilize capabilities of new Trapeze software to simplify and streamline publishing of timetables. Ensure that staff have adequate training in use of the new software.
3d. Operator conduct complaints.	·Clarify what performance is being measured.·Set realistic goals for reducing operator conduct complaints.·Improve the efficiency and accuracy of complaint information uptake.
4d. Annual passenger surveys and follow-up by management.	·In order to use survey results to implement improvements, it will be necessary to further develop the connection between information, analyses, and programmatic action.·Amend Definition of Measurement to remove focus groups.
5d. Improvements in public information regarding vehicle delays during operations as well as any general user information regarding system modifications, route changes and schedules.	·Further revise the Goal, Purpose, Definition and Method of Measurement, and Milestones for this service standard.

Service Standard	Recommendations
6d. Efforts to improve driver training, technical as well as accident follow-up.	·Do not double count Violence in the Workplace training.·Ensure that Definition of Measurement accurately describes the accidents being measured.·Consider reporting the accident rate in a manner consistent with industry standards (e.g., accidents per 100,000 revenue miles).·Implement a comprehensive approach and coordinated effort to reduce accidents across divisions and departments by focusing on enforcement of safety rules and procedures and thorough review of all accidents.
7d. Number of crime incidents on Municipal Railway vehicles or in Municipal Railway facilities.	·Include fare evasions issued by Muni fare inspectors.·Develop a consistent method for coding crime incidents.·Amend indicator purpose to "To measure the crime rate on transit vehicles and facilities."
E. EMPLOYEE SATISFACTION	
1e. Number of grievances.	·Grievances are not tracked by division. Either amend the Definition of Measurement or change reporting.·Establish a goal or benchmark for the number of grievances filed.
2e. Speed of resolution of grievances.	·Closely examine method for reporting speed of resolution of non-operator grievances to ensure that data are reported correctly in the future.
3e. Longevity of employment.	·The Service Standards Reports show "Average Years of Muni Service." This terminology is incorrect since the report shows average years of service with the City of San Francisco for all job categories that are not Muni-specific.·This measure does not provide any useful information on employee satisfaction. Either eliminate this service standard, or move it to the Staffing Performance section.
4e. Employee recognition.	·Report on the actual number and type of awards made quarterly and annually.
5e. Employee education and training opportunities.	·Track all employee training hours in some type of centralized system in order to facilitate future reports and audits.

APPENDIX A

PROPOSITION E SERVICE STANDARDS – STAFF AND AUDITOR ASSIGNMENTS

Proposition E Service Standards – Staff and Auditor Assignments

Service Standard Number	Performance Indicator Name	Responsible Individual (s)	Nelson\Nygaard Team Auditor
a. SYSTEM RELIABILITY			
1a. SYSTEM RELIABILITY	% of Vehicles that run on time according to published schedules (no more than 4 minutes late or 1 minute early) measured at terminals and established intermediate points.	Susan Chelone SCHEDULES	Angelo Figone
2a. SYSTEM RELIABILITY	% of Scheduled service hours that are delivered and percentage of scheduled vehicles that begin service at the scheduled time.	Peter Der OPERATIONS For FY04-Ed Wong	Angelo Figone
3a. SYSTEM RELIABILITY	Missed service due to either insufficient vehicles or driver unavailability as a percentage of scheduled service hours	Peter Der OPERATIONS For FY04-Ed Wong	Angelo Figone
4a. SYSTEM RELIABILITY	% of Pass-ups determined when supervisory personnel review all the lines checked in the previous quarter, and identify the five lines with the highest load factors, and the time period these load factors occurred.	Susan Chelone SCHEDULES	Angelo Figone
5a. SYSTEM RELIABILITY	Peak period passenger load factors	Susan Chelone SCHEDULES	Angelo Figone
6a. SYSTEM RELIABILITY	Actual headways against scheduled headways on all radial express, cross-town, secondary, and feeder lines for peak, base, evening, and late night services.	Susan Chelone SCHEDULES	Angelo Figone
7a. SYSTEM RELIABILITY	% vehicle availability by mode.	Deborah Denison OPERATIONS-ADMIN	Kara Vuicich
8a. SYSTEM RELIABILITY	Unscheduled absences by operator, mechanical and administrative personnel.	Deborah Denison Carolyn Low IT	Kara Vuicich
9a. SYSTEM RELIABILITY	Miles between roadcalls by mode	Jack Hieda LRV Virgil Dennis-Motor Coach Woon Wong-Presidio Trolley Tony Chan – Potrero Trolley Patrick Ho – Cable Car	Kara Vuicich

Service Standard Number	Performance Indicator Name	Responsible Individual (s)	Nelson\Nygaard Team Auditor
b. SYSTEM PERFORMANCE			
1b. SYSTEM PERFORMANCE *	**Passengers carried by mode - FTA submittal - audited**	~~David Makofsky~~ ~~Schedules~~ Susan Chelone	Kara Vuicich
2b. SYSTEM PERFORMANCE	Fare revenues generated by mode? **FTA submittal - audited**	Eloida Leonardo Finance	Bonnie Nelson
3b. SYSTEM PERFORMANCE *	**Hours and Miles operated by mode - FTA submittal - audited**	~~David Makofsky~~ Schedules Susan Chelone	Kara Vuicich
4b. SYSTEM PERFORMANCE	Expenses incurred by mode	Fred Clarke Finance	Bonnie Nelson
c. STAFFING PERFORMANCE			
1c. STAFFING PERFORMANCE	Net vacancies by position (vacancies remaining once promotions and new hires have been deducted from retirees or resignations) for each division.	Lynn Prince HR	Kara Vuicich
2c. STAFFING PERFORMANCE	Attrition rates for new employees, by division and level	Lynn Prince HR	Kara Vuicich
d. CUSTOMER SERVICE			
1d. CUSTOMER SERVICE	Development of an annual marketing plan identifying specific programs and projects that will promote increased patronage.	Mark Caposino Marketing	Carmen Clark
2d. CUSTOMER SERVICE	Publication and distribution to the public of schedules for all trips taken by all vehicles which shall consist of specific arrival times at terminals and established intermediate points.	Alan Siegel Community Affairs Bob Calwell Planning	Carmen Clark
3d. CUSTOMER SERVICE	Operator conduct complaints and their resolution, by complaint, consistent with due process and required confidentiality.	Maria Williams PSR Unit	Carmen Clark
4d. CUSTOMER SERVICE	Annual passenger surveys and follow-up by management.	Mark Caposino Marketing	Carmen Clark
5d. CUSTOMER SERVICE	Improvements in public information regarding vehicle delays during operations as well as general user information regarding system modifications, route changes, and schedules.	Jeff Hamilton Community and Public Relations	Bonnie Nelson

Service Standard Number	Performance Indicator Name	Responsible Individual (s)	Nelson\Nygaard Team Auditor
6d. CUSTOMER SERVICE	Efforts to improve driver training, technical as well as accident follow-up. * Ron Hundenski provided most of the accident data in the audit time period. Now provided by Paul Lovette ** Bud McNaughton retired. Currently provided by Doris Lanier	Ron Hundenski Paul Lovette *Accidents Bud McNaughton- **Training Mike Kirchanski Doris Lanier Paul Petersen	Kara Vuicich
7d. CUSTOMER SERVICE	Number of crime incidents on Municipal Railway vehicles or in Municipal Railway facilities.	Michelle Blalock Security	Kara Vuicich
e. EMPLOYEE SATISFACTION			
1e. EMPLOYEE SATISFACTION	Number of grievances	Mike Casey Human Resources Mabel Shaw Human Resources	Kara Vuicich
2e. EMPLOYEE SATISFACTION	Speed of resolution of grievances	Mike Casey Human Resources	Kara Vuicich
3e. EMPLOYEE SATISFACTION	Longevity of employment	Michael Lum Human Resources Hannah Staroselsky Human Resources	Kara Vuicich
4e. EMPLOYEE SATISFACTION	Employee Recognition	Employee Recognition Program Organizer Orange Rose	Kara Vuicich
5e. EMPLOYEE SATISFACTION	Employee education and training programs	Deborah Denison Vernon Crawley Rich Dale Patty Deleon Barbara Conway Paul Petersen	Kara Vuicich